

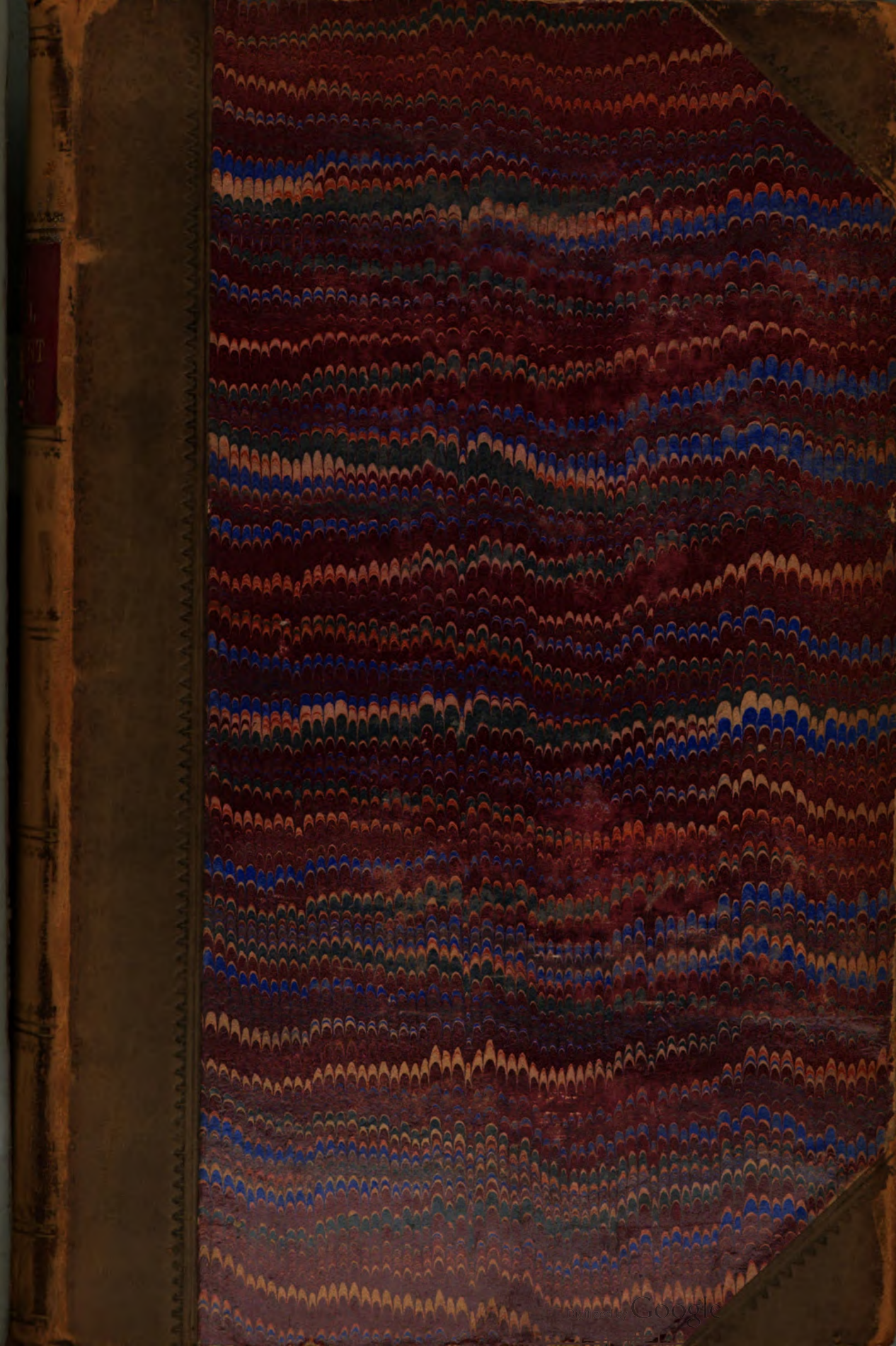
---

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google<sup>™</sup> books

<https://books.google.com>

















# ARMY MEDICAL DEPARTMENT

## REPORT

FOR THE YEAR 1885.

---

VOLUME XXVII.

---



LONDON:  
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,  
BY EYRE AND SPOTTISWOODE,  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

And to be purchased, either directly or through any Bookseller, from  
EYRE AND SPOTTISWOODE, EAST HARDING STREET, FLEET STREET, E.C.; or  
ADAM AND CHARLES BLACK, 6, NORTH BRIDGE, EDINBURGH; or  
HODGES, FIGGIS, & Co., 104, GRAFTON STREET, DUBLIN.

---

1887.

*Price 3s. 9d.*





TO THE RIGHT HONOURABLE

THE SECRETARY OF STATE FOR WAR.

---

SIR,

IN accordance with instructions laid down for the conduct of business by the Director-General and Heads of Branches of the Army Medical Department, I have the honour to submit the accompanying Report on the Health of the Army in 1885, drawn up by the Officers in charge of the respective Branches.

I have the honour to be,

SIR,

Your most obedient

Humble Servant,

T. CRAWFORD,

*Director-General.*

ARMY MEDICAL DEPARTMENT,  
*June 1887.*



# CONTENTS.

Letter from the Director-General to the Secretary of State for War	PAGE iii
REPORT.	
I. Summary of the Health of White Troops at all Stations	1
II. On the Health of the Troops serving in the UNITED KINGDOM—	
Sickness and Mortality	4
Remarks on the Prevalence of the principal Diseases in Military Districts	15
Admissions, Deaths, and Invaliding, &c., from the different Arms of the Service	16
Officers, Women and Children	17
Vaccination	21
On the Recruiting of the Army	25
Number of Recruits Inspected and Rejected	25
Native Countries of Recruits inspected	26
Number inspected for each Arm of the Service	26
Previous occupations of Recruits	27
Extent of Education of Recruits inspected	27
Causes of Rejection of Recruits	28
Ages of Recruits	29
Tables showing the Heights, Weights, and Chest Measurements of Recruits	30
On the influence of Age on Mortality	34
HOME STATIONS. <i>Sanitary Conditions</i> —	
Northern District	35
Eastern District	35
Western District	36
Southern District	36
Netley	37
Chatham District	38
South-Eastern District	38
Home District	39
Woolwich District	39
Aldershot	40
North British District	41
Channel Islands	41
Ireland:	
Belfast District	42
Dublin District	42
Cork District	43
Curragh District	43
III. On the Health of the Troops serving in the MEDITERRANEAN—	
I. Gibraltar:	
Sickness and Mortality	45
Sanitary Conditions	49
II. Malta:	
Sickness and Mortality	49
Sanitary Conditions	54
Royal Malta Fencible Artillery	
Sickness and Mortality	55
Sanitary Conditions	56

	PAGE
III. Cyprus :	
Sickness and Mortality - - - - -	57
Sanitary Conditions - - - - -	60
IV. On the Health of the Troops serving in the DOMINION OF CANADA—	
Sickness and Mortality - - - - -	61
Sanitary Conditions - - - - -	63
V. On the Health of the Troops serving in BERMUDA—	
Sickness and Mortality - - - - -	65
Sanitary Conditions - - - - -	67
VI. On the Health of the Troops serving in the WEST INDIES—	
i. White Troops :	
Sickness and Mortality - - - - -	69
Sanitary Conditions - - - - -	71
ii. Black Troops :	
Sickness and Mortality - - - - -	72
Sanitary Conditions - - - - -	73
VII. On the Health of the Troops serving in WESTERN AFRICA—	
i. White Troops :	
Sickness and Mortality - - - - -	74
ii. Black Troops :	
Sickness and Mortality - - - - -	74
Sanitary Conditions - - - - -	75
VIII. On the Health of the Troops serving at the CAPE OF GOOD HOPE AND ST. HELENA—	
Sickness and Mortality - - - - -	77
Sanitary Conditions - - - - -	81
IX. On the Health of the Troops serving in the MAURITIUS—	
Sickness and Mortality - - - - -	82
Sanitary Conditions - - - - -	84
X. On the Health of the Troops serving in Ceylon—	
i. White Troops :	
Sickness and Mortality - - - - -	86
Sanitary Conditions - - - - -	88
ii. Asiatic Troops :	
Sickness and Mortality - - - - -	89
XI. On the Health of the Troops serving in CHINA and the STRAITS SETTLEMENTS—	
i. White Troops :	
Sickness and Mortality - - - - -	90
Sanitary Conditions - - - - -	94
ii. Asiatic Troops :	
Sickness and Mortality - - - - -	95
XII. On the Health of the European Troops serving in INDIA—	
Sickness and Mortality - - - - -	96
i. Bengal :	
Sickness and Mortality - - - - -	97
Sanitary Conditions - - - - -	112
ii. Madras :	
Sickness and Mortality - - - - -	115
Sanitary Conditions - - - - -	124
iii. Bombay :	
Sickness and Mortality - - - - -	127
Sanitary Conditions - - - - -	137
XIII. On the Health of Troops serving in EGYPT—	
Sickness and Mortality - - - - -	141
Sanitary Conditions - - - - -	148

	PAGE
XIV. On the Health of the Troops on BOARD SHIP—	
I. Troops proceeding on Foreign Service - - -	150
II. „ returning from ditto - - -	151
III. „ proceeding from one Station abroad to another - - -	152
IV. Invalids returning to England - - -	153

## ABSTRACTS—HOME.

No. I.—United Kingdom, Summary of the Health of the Troops serving in - - -	154
A.—Northern District, ditto - - -	156
B.—Eastern District, ditto - - -	158
C.—Western District, ditto - - -	160
D.—Southern District, ditto - - -	162
E.—Chatham District, ditto - - -	164
F.—South-Eastern District, ditto - - -	166
G.—Home District, ditto - - -	168
H.—Woolwich District, ditto - - -	170
I.—Aldershot District, ditto - - -	172
J.—North British District, ditto - - -	174
K.—Channel Isles, ditto - - -	176
L.—Belfast District, ditto - - -	178
M.—Dublin District, ditto - - -	180
N.—Cork District, ditto - - -	182
O.—Curragh District, ditto - - -	184
P.—Summary of the Health of the Officers, Women, and Children in the United Kingdom - - -	186

## ABSTRACTS—FOREIGN.

No. II.—Gibraltar, Summary of the Health of the Troops serving in - - -	188
III.—Malta, ditto - - -	190
III A. „ Royal Fencible Artillery, ditto - - -	192
IV.—Cyprus, ditto - - -	194
V.—Dominion of Canada, ditto - - -	196
VI.—Bermuda, ditto - - -	198
VII.—West Indies, White Troops, ditto - - -	200
VIII.—Ditto, Black Troops, ditto - - -	202
IX.—West Africa, ditto - - -	204
X.—Cape of Good Hope and St. Helena, ditto - - -	206
XI.—Mauritius, ditto - - -	208
XII.—Ceylon, ditto - - -	210
XIII.—China and Straits Settlements, ditto - - -	212

## ABSTRACTS—INDIA.

*Bengal.*

No. XIV.—Summary of the Health of the Troops serving in - - -	214
XV.—Admissions and Deaths at the chief Stations - - -	216
XVI.—Admissions and Deaths by Classes of Diseases in each of the Military Divisions - - -	218
XVII.—Enteric Fever - - -	222
XVIII.—Cholera - - -	224
XIX.—Dysentery, Diarrhoea, and Hepatitis in each Division - - -	225
XX.—Ditto, ditto, comparative prevalence to Seasons - - -	226
XXI.—Mortality and Invaliding - - -	227

*Madras.*

XXII.—Summary of the Health of the Troops serving in - - -	228
XXIII.—Admissions and Deaths at the chief Stations - - -	230
XXIV.—Admissions and Deaths by Classes of Diseases in each of the Military Divisions - - -	232
XXV.—Enteric Fever - - -	234
XXVI.—Cholera - - -	234
XXVII.—Dysentery, Diarrhoea, and Hepatitis in each Division - - -	235
XXVIII.—Ditto, ditto, comparative prevalence to Seasons - - -	236
XXIX.—Mortality and Invaliding - - -	238



	PAGE
<i>Bombay.</i>	
XXX.—Summary of the Health of the Troops serving in	240
XXXI.—Admissions and Deaths at the chief Stations	242
XXXII.—Admissions and Deaths by Classes of Diseases in each of the Military Divisions	244
XXXIII.—Enteric Fever	246
XXXIV.—Cholera	246
XXXV.—Dysentery, Diarrhoea, and Hepatitis in each Division	247
XXXVI.—Ditto, ditto, comparative prevalence to Seasons	248
XXXVII.—Mortality and Invaliding	250
XXXVIII.—Egypt.—Summary of the Health of the Troops serving in	252
XXXIX.—Troops on Board Ship, Summary of the Health of the	254
XL.—Influence of Age on Mortality in Foreign Commands	256
XLI.—Health Statistics of Corps in the United Kingdom	257
XLII.—Health Statistics of Corps in Foreign Commands, ex- clusive of India	281
XLIII.—Health Statistics of Corps in Bengal	293
XLIV.—Health Statistics of Corps in Madras	300
XLV.—Health Statistics of Corps in Bombay	304
XLVI.—Return showing the comparative sickness, mortality, and invaliding of men who have extended their service in India, and those who have not, stationed in the Bengal, Madras, and Bombay Presidencies in 1885	308

APPENDIX.

	PAGE
I.—Medical History of the Frontier Field Force on Active Service in the Soudan from 27th November 1885 to 27th January 1886. By Surgeon-Major W. S. M. Price, Medical Staff	309
II.—Medico-Topographical Report of the North-West Frontier of India, Beluchistan, and Southern Afghanistan. By Surgeon-Major Thomas O'Farrell, M.A., M.D., Medical Staff	318
III.—A sketch of the Medical arrangements suitable for an Army Corps operating in Beluchistan and Southern Afghanistan. By Surgeon-Major T. O'Farrell, M.A., M.D., Medical Staff	330
IV.—An inquiry into the relation of Malaria to physical causes at Meean Meer, Punjab; with an analysis of soil and water, and a resumé of Meteorological observations. By Surgeon R. H. Firth, F.R.C.S. Eng., Medical Staff	345
V.—Case of Enteric Fever with extraordinary high temperature. By Surgeon-Major G. E. Dobson, M.A., M.B., F.R.S., Medical Staff	357
VI.—A case of Liver Fluke ( <i>Fasciola Hepatica</i> ). By Surgeon W. L. Chester, M.B., Medical Staff	359
VII.—Report on Epidemic Cerebro-Spinal Fever at Devonport during 1885–86. By Surgeons J. Stevenson, M.B., and E. F. Smith, Medical Staff	361
VIII.—On the occurrence of Jaundice, Icteric Urine, and Hæmatinuria in Remittent Fever. By Surgeon R. H. Firth, F.R.C.S. Eng., Medical Staff	367
IX.—Report on a case of Inflammation of the Connective Tissue. By Surgeon-Major H. F. L. Melladew, M.D., Royal Horse Guards	371
X.—Medico-Topographical Report. By Surgeon-Major J. Lane Notter, B.A., M.D., Medical Staff	373
XI.—Some remarks on "Beri-Beri," a disease largely prevalent in the Straits Settlements, with a few notes of cases, &c. By Surgeon A. A. Lyle, Medical Staff	379
XII.—Report on a case of Enteric Fever occurring twice in the same individual. By Surgeon-Major A. Lever, Medical Staff	385
XIII.—Report of a case of "Concussion of the Spine." By Surgeon J. G. Harwood, Medical Staff	386
XIV.—Case of Empyema. By Surgeon-Major O. G. Wood, M.D., Medical Staff	389
XV.—Report on the Abu Fatma Hospital and Line of Communication with Nile Expedition, 1884–85. By Surgeon-Major L. Corban, M.D., Medical Staff	391
XVI.—A brief survey of the effects of high temperature on the body, with special reference to the nature, prevention, and treatment of heat-stroke. By Surgeon M. R. Ryan, M.D., Medical Staff	396

	PAGE
No. XVII.—Notes on the Surgical Practice at the Royal Arsenal, Woolwich, during 1884 and 1885. By Surgeon-Major G. T. Langridge, L.R.C.P. Lond., M.R.C.S. Eng., Medical Staff - - - - -	412
XVIII.—List of operations at Netley, 1885. By Brigade-Surgeon C. H. Y. Godwin, Medical Staff, Assistant Professor of Military Surgery - - - - -	427
XIX.—Report on the outbreak of Diphtheria in the neighbourhood of the Royal Military College, Sandhurst. By Brigade-Surgeon Alfred F. S. Clarke - - - - -	433
XX.—Report of a series of cases of Small-pox which occurred among the British Troops in Cairo, 1885. By Surgeon I. Boulger, Medical Staff - - - - -	442
XXI.—Meteorological observations at Netley and Foreign Stations	455
XXII.—The Parkes' Memorial Prize - - - - -	472
XXIII.—The Alexander Memorial Fund - - - - -	473

---

# ARMY MEDICAL DEPARTMENT REPORT FOR 1885.

## STATISTICAL REPORT.

THE average annual strength of the troops serving at home and abroad in 1885, as computed from the returns received by the Army Medical Department, was 177,928 warrant officers, non-commissioned officers and men (exclusive of the Royal Malta Fencible Artillery, the 1st and 2nd West India Regiments, and the Gun Lascars at Ceylon, and at Hong Kong, Corps which are recruited locally); the admissions into hospital in this force were 201,295 and the deaths 1,993. The rates represented by these numbers are for admissions into hospital 1131·4 and for deaths 11·12 per 1,000 of the average annual strength, the latter being calculated on a strength of 179,154, which includes detached men.

The statistics of some of the most important of the results of sickness, in every Command in which the troops were stationed, are exhibited in the following Table :—

1885.

White Troops.	Average Strength.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
<b>Troops at Home and Abroad</b>	<b>177,928</b>	<b>201,295</b>	<b>1,993</b>	<b>3,435</b>	<b>3,478</b>	<b>10,098·77</b>
United Kingdom	87,105	76,426	590	—	1,909	4221·66
Gibraltar	4,353	4,587	35	171	63	253·58
Malta	4,602	4,249	68	124	57	272·04
Cyprus	852	918	18	7	5	37·15
Egypt	9,593	14,601	278	1,462	473	769·71
Canada	1,273	910	10	34	35	52·19
Bermuda	1,385	684	18	33	8	38·83
West Indies	900	830	7	17	6	38·77
Cape of Good Hope and St. Helena	3,939	3,472	35	158	85	205·41
Mauritius	358	898	6	14	5	29·51
Ceylon	809	950	8	24	16	51·13
China and Straits Settlements	2,188	2,454	25	88	48	93·97
India	57,165	87,000	868	1,303	768	4034·82
On board Ship	3,406	3,316	27	—	—	—

*Troops at  
Home and  
Abroad.*

1885.

White Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
Troops at Home and Abroad	*	†	‡	§		Days.	Days.
United Kingdom	877.4	6.68	—	21.61	48.46	17.69	20.16
Gibraltar	1033.8	8.04	39.28	14.50	58.25	21.26	20.17
Malta	923.8	14.77	26.94	12.38	59.11	21.57	23.37
Cyprus	1077.4	21.13	8.21	5.87	43.60	15.91	14.80
Egypt	1522.0	28.98	152.40	49.30	80.23	29.28	19.24
Canada	714.8	7.86	26.71	27.50	41.00	14.96	20.93
Bermuda	493.9	13.00	23.83	5.77	28.04	10.23	20.72
West Indies	922.2	7.77	18.88	6.66	43.08	15.72	17.05
Cape of Good Hope and St. Helena	881.4	8.89	40.11	21.57	52.14	19.03	21.59
Mauritius	2508.4	16.76	39.10	13.97	82.43	30.09	11.99
Ceylon	1174.3	9.89	29.66	19.78	63.20	23.07	19.64
China and Straits Settlements	1121.6	11.43	40.22	21.94	42.95	15.68	13.98
India	1521.9	15.18	22.79	13.43	70.58	25.76	16.93
On board Ship	973.5	7.92	—	—	—	—	—

\* Calculated on strength, excluding men detached (1,226).

† Calculated on strength, including men detached.

‡ Calculated on strength, excluding United Kingdom and troops on board ship.

§ Calculated on strength, including men detached, and excluding troops on board ship.

|| Calculations exclude men detached and troops on board ship.

1875 to 1884.

White Troops.	Aggregate strength for 10 years.	Admissions into Hospital.	Deaths.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
Troops at Home and Abroad	1,700,225	1,800,666	20,609	31,082	36,610	85,605
United Kingdom	870,173	733,554	6,558	—	23,199	38,106
Gibraltar	46,243	37,771	308	1,375	633	2,160
Malta	48,775	41,763	480	1,433	771	2,410
*Cyprus	3,999	6,842	70	212	70	327
†Egypt	14,365	17,185	350	989	341	1,097
Canada	16,883	12,168	96	405	288	631
Bermuda	17,675	11,232	133	307	134	609
West Indies	9,766	8,643	150	262	151	435
Cape of Good Hope and St. Helena	53,550	44,036	2,118	3,096	1,141	2,683
Mauritius	3,894	8,516	67	176	56	308
Ceylon	9,991	10,844	145	382	141	574
China and Straits Settlements	19,177	19,760	202	806	326	949
India	558,962	828,886	9,745	21,639	9,309	35,316
On board Ship	26,772	19,466	187	—	—	—

\* For seven years only.

† For two years only.



1875 to 1884.

*Troops at  
Home and  
Abroad.*

White Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
<b>Troops at Home and Abroad</b>	<b>1059·1</b>	<b>11·84</b>	<b>38·69</b>	<b>21·36</b>	<b>51·15</b>	<b>Days. 18·67</b>	<b>Days. 17·54</b>
United Kingdom -	843·0	7·20	—	25·48	43·79	15·98	18·96
Gibraltar -	780·0	6·66	29·73	13·68	46·71	17·04	21·85
Malta -	856·2	9·84	29·38	15·81	49·41	18·03	21·06
*Cyprus -	1710·9	17·50	53·01	17·50	81·77	29·84	17·44
†Egypt -	1196·3	24·36	68·84	23·74	76·42	27·89	23·31
Canada -	720·7	5·69	23·99	17·06	37·37	13·64	18·93
Bermuda -	635·5	7·52	17·37	10·41	34·45	12·58	19·79
West Indies -	885·0	15·36	26·82	15·46	44·54	16·26	18·37
Cape of Good Hope and St. Helena -	822·3	39·55	57·81	21·31	50·10	18·29	22·24
Mauritius -	2186·9	17·21	45·20	14·38	79·15	28·88	13·21
Ceylon -	1085·4	14·51	38·23	14·11	57·45	20·97	19·32
China and Straits Settlements -	1080·4	10·53	42·03	17·00	49·52	18·07	17·54
India -	1482·9	17·43	38·71	16·65	63·18	23·06	15·55
On board Ship -	727·1	6·98	—	—	—	—	—

\* For seven years only.

† For two years only.

## II.—ON THE HEALTH OF THE TROOPS SERVING IN THE UNITED KINGDOM.

### *Sickness and Mortality.*

#### *United Kingdom.*

The average strength of warrant officers, non-commissioned officers and men serving in the United Kingdom during the year 1885 was 87,105, calculated from returns received from medical officers. The admissions were 76,426 in number, the deaths 590 (including 40 among men detached from their corps, the average number of whom is found to have been 1,226), and the number of invalids discharged the service was 1,909. The average number of men non-effective daily through sickness was 4221·66, the average sick time to each soldier 17·69 days, and the average duration of each case of sickness 20·16 days.

The ratio of admission per 1,000 of strength, therefore, was 877·4, that of death 6·68, that of discharge by invaliding 21·61, and that of constant inefficiency through sickness 48·46.

Compared with the corresponding rates for the preceding year an increase has occurred in the ratios of admission and invaliding, being 7·2 and 72 per 1,000 respectively, the mortality ratio also is greater by 1·35; the ratio of constantly sick has declined by 36 per 1,000. The average sick time to each soldier and the average duration of each case of sickness are less than the corresponding periods in the preceding year by 18 and 37 days respectively.

In comparison with the similar average rates for the preceding 10 years, an increase is observed in the ratio of admission equal to 34·4 per 1,000, and one in the ratio of constantly sick, equal to 4·67 per 1,000; in the mortality rate, however, there is a decline of 52, and in the invaliding rate one of 3·87 per 1,000. The average sick time to each soldier, and the average duration of each case of sickness, are longer than the corresponding decennial average periods by 1·71 days and 1·20 days respectively.

The total loss for the year by death and final discharge of men from the service by invaliding was 2,499, equal to 28·29 per 1,000, which is greater than in the preceding year by 2·07.

The admissions, deaths, invaliding, &c., in the various classes and orders of diseases are given in Abstract I., and similar information for the different military districts will be found in the Abstracts lettered from A to O.

**GENERAL DISEASES.—Febrile Group.**—The admissions into hospital for diseases of this group were 2,663; there were 55 deaths, and the average number constantly sick was 121. The ratio of admission was 30·6 per 1,000, that of mortality 62, and that of constant inefficiency from febrile affections 1·39 per 1,000. Compared with the corresponding rate for the preceding year a slight decrease, 4 per 1,000, is observed in admission rate, an increase of 28 in death rate, and one of 04 per 1,000 in the constantly sick rate; and in comparison with similar average rates for the preceding six years there is a decrease of 10·4 per 1,000 in admission rate, and one of 21 in the constantly sick rate, but an increase of 16 per 1,000 in the death rate.

**Eruptive Fevers** caused 396 admissions and 6 deaths, being in the ratios of 4·5 and 06 per 1,000 respectively, as compared with 5·7 and 01 per 1,000 in the previous year, and with 5·7 and 06 per 1,000, the average ratios for the preceding six years.

**Small-pox**, which in the previous year caused 10 admissions all of which recovered, attacked 19 men, 3 of whom died. The cases occurred as follows:—5 at Enniskillen, 1 being fatal, it is said that the disease was introduced from Taunton, where it was prevalent; London 3 cases, 1 fatal; Colchester 3 cases, believed to have been imported from London; Taunton and Horfield each 2 cases, the disease was prevalent in the neigh-

bourhood of both these places; Hounslow 1 case, fatal, contracted in London; and Gosport, Bodmin, and York 1 case respectively, which recovered. *United Kingdom.*

Scarlet fever was not so prevalent as in 1884, there being 96 cases, equal to a ratio of 1·1 per 1,000, as compared with 170, or 2·0 per 1,000, in that year. There were, however, 3 deaths. Most of the districts were affected in some degree, the Channel Islands, Woolwich, and Aldershot districts being exceptions. The disease occurred at 33 stations, scattered over the kingdom, 12 cases occurring in London, 8 in Dublin, 8 (2 fatal) in Fermoy, 7 in Templemore (1 fatal), 6 at Devonport, Windsor, and Colchester respectively, 4 at Bury St. Edmunds, 3 at Dover, Taunton, and Devizes, 2 each at Pembroke Dock, Winchester, Northampton, Chatham, Gravesend, Canterbury, Oxford, and Glencorse, and 1 case at Portsmouth, Carlisle, Newcastle, Wrexham, Shoburness, Edinburgh, Fort George, Hamilton, Omagh, Buttevant, Tipperary, Kilkenny, Clonmel, and the Curragh respectively.

Measles also compares favourably with the previous year as regards prevalence, 128 cases or 1·5 per 1,000 of strength, being recorded against 173 cases, or 2·1 per 1,000, in the last return. Every district was affected, though several very slightly. The greatest prevalence was in Woolwich, where 27 cases occurred, this was followed by the Dublin district with 16 cases, the Southern district with 15, the Northern and Home districts with 14 cases respectively, the Eastern district with 12, and single numbers in the remaining districts. 14 cases of chicken-pox and 139 of cow-pox, compared with 7 of the former and 114 of the latter in the preceding year, complete the admissions under this order of febrile diseases.

*Continued Fevers* caused 1,137 admissions and 46 deaths, being in the ratios of 13·1 and ·53 per 1,000 of strength respectively. Compared with the corresponding rates for the preceding year a decline of admission rate equal to ·4 per 1,000 is observed, but an increase of mortality equal to ·33 per 1,000; the rate of constantly sick is slightly increased; and in comparison with the average similar rates for the previous six years there is a decline of 1·9 per 1,000 in admission rate, an increase in death rate of ·23 per 1,000, while there is scarcely any difference in the ratio of constantly inefficient through sickness. The increase in the mortality rate is due to the greater number of deaths from enteric fever.

*Enteric Fever* shows an increase in prevalence. The number of cases, which in the previous year had fallen to 89 with 17 deaths, rose again in the year under report to 146, of which 42 were fatal; and this increase is chiefly due to the occurrence of cases in men recently returned from service in Egypt. The ratio of admission was 1·7 and that of mortality ·48 per 1,000 as compared with 1·1 and ·19 per 1,000 in the preceding year, and with 1·3 and ·18 per 1,000, the corresponding average rates for the previous six years respectively. The mortality to attacks amounted to 28·8 per cent., the average rate being 20·2, and that in the preceding year 19·1 per cent. With the exception of Chatham and the Channel Islands, enteric fever occurred in all the different administrative districts, the greatest prevalence being in the Home, Dublin, and Southern districts, where the cases numbered 47, 24, and 21 respectively. The greatest number of cases in a single station was 38 in London, but there were only 5 deaths; the mortality rate was therefore low. With regard to these cases it is stated that nearly all of them occurred in men just returned from Suakin, and that the period of incubation in them was unusually long; of these cases 3 died. There were 3 cases at the Tower, of which 2 proved fatal, which were not connected with Egypt; and 1 case at Hyde Park barracks was believed to be dependent on a drain which had been opened. In Dublin 23 cases occurred, 6 of them fatal. The cases came from different barracks, 11 from Richmond barracks, 4 from the Royal barracks, 3 from Portobello, 2 from Island Bridge, and 1 from Ship Street, the Royal Infirmary, and from shipboard respectively. Of the cases at Richmond barracks 6 had recently returned from Egypt, where the disease was probably contracted, but no local insanitary cause could be discovered for the remainder, though careful examination was made. The same is said with regard to the cases which occurred at Portobello and the Royal barracks, &c. The case at the Royal Infirmary was a man who had been in attendance on a patient suffering from the disease, and the case from shipboard came from a regiment *en route* from Chatham to Athlone. In the Aldershot division there were 16 cases and 9 deaths, of

*United Kingdom.*

which 11 cases, 8 being fatal, occurred in men who had just returned from Egypt, where the disease was contracted. Aldershot is accountable for 3 cases and 1 death, but their origin could not be ascribed to any local insanitary condition. Of the remaining 2 cases 1 occurred at Pirbright camp, and the other, a mild case, in a man just from Windsor. At Portsmouth there were 11 cases and 5 deaths. Three of the fatal cases came from shipboard on arrival from abroad. The Principal Medical Officer thinks that such cases in part explain the fact that this station has a large number of admissions for enteric fever; but the disease, however, is common among the civil population. Of 5 cases in Gosport, 1 fatal, the cause was not traced. At Windsor 4 cases are recorded, and 3 of them in men from active service in Egypt. At Clonmel there were 4 cases, 1 fatal, and at Tralee 3 cases; these could not be attributed to any insanitary conditions. At Woolwich, Netley, and Caterham, there were 3 cases each for which no cause is assigned, while 3 cases at Pontefract were possibly connected with the faulty ventilation of a sewer; and 3 at Piershill, though not directly traceable to any particular local defect, may have been influenced by certain insanitary surroundings. Two cases respectively occurred in Oxford, Edinburgh, Cork (each with 1 fatal case), and York. In the first-named place the cases came from Egypt, but in the remainder the origin of disease could not be traced. Single fatal cases occurred at Pembroke Dock, the Curragh, Norwich, Great Yarmouth, and Preston, for these no local insanitary cause is given; also at Shorncliffe and Leeds, these were contracted away from the station; at Brighton, a case from Egypt, and at Chester, one attributable to faulty drainage. Single cases, which recovered, are returned from 10 stations. No cause could be traced for those occurring in Ayr, Hilsea, Sheffield, and Queenstown; those at Parkhurst, Belfast, Bradford, and Birm were, it is said, contracted away from the station; and a case at Limerick was probably contracted in Egypt, from which country the man had recently returned.

*Other continued fevers* caused 991 admissions and 4 deaths, equal to ratios of 11·4 and ·05 per 1,000 of strength. The ratio of admission compares favourably with 12·4 in the preceding year, and with an average rate of 13·7 per 1,000. Four cases are returned as typhus fever, two occurred at Tralee, 1 of which was fatal, and 1 case occurred in Kinsale; it is said that the disease was prevalent in both these towns; the other case happened in Dublin, and its origin could not be ascertained. There were also 3 cases of cerebro-spinal fever; 2 cases occurred in Dublin, 1 being fatal, and 1, also fatal, at Chester. The origin of the former cases is not stated, and of the latter it is remarked that "the only cause which could be" ascertained was exposure in a bell tent in very hot weather." *Febricula* is shown as the cause of 804 admissions, and simple continued fever of 180; 1 death, which occurred in a man detached from his corps, is referred to the latter disease. Comparing the rates of prevalence of these fevers in the different administrative districts, the highest rates are found in the Home and Aldershot districts, being respectively 18·1 and 16·8 per 1,000, Dublin following next with 15·2 per 1,000, Belfast with 13·0, the South-eastern district with 12·5 per 1,000, &c. The lowest rate, 4·9 per 1,000, was in the Woolwich district, the next above being 5·3 in the Curragh district. Compared with the preceding year an increase of prevalence equal to 7·5 per 1,000 is noticed in the Chatham district, one of 4·3 in the Home district, and one of 2·9 in the Eastern district, while decrease is noticed principally in the Northern district, 8·2 per 1,000, in the Southern district 3·8, the Curragh 3·0, and the North British 2·7 per 1,000; the remaining districts do not show any great variation.

*Paroxysmal Fevers* caused 676 admissions, equal to 7·8 per 1,000, which is higher than the rate in the preceding year by 2·2, though still considerably below the average ratio of the last six years, which amounts to 12·3 per 1,000. No death from these fevers occurred; 16 of the cases were remittent fever, and the remainder ague. The greatest prevalence of these fevers was in the South-eastern district, the ratio of admission being 16·3 per 1,000; this is followed by 12·1 in the Woolwich district, and by 11·0 per 1,000 in the Channel Islands; the lowest rate was 1·6 per 1,000 in the Belfast district, the next above being 3·8 in the Home district, and 4·0 in the North British district. Compared with the return for the preceding year it is observed that with the exception of the Southern district, where it has decreased by 3·0 per 1,000, the rate of prevalence has increased in all the administrative districts. The in-

crease is most marked in the Eastern, Aldershot, and Channel Islands districts, being 7·5, 5·4, and 5·3 per 1,000 respectively; in the remaining districts the increase is less, and in the Northern district it is only fractional. Of the cases of remittent fever 7 occurred in the Northern district (4 being at Weedon), 3 in the Southern district, 2 each in the Chatham and Home districts, and 1 in the Belfast and Western districts respectively.

*United Kingdom.*

454 admissions are recorded for *other diseases* of the febrile group, equal to 5·2 per 1,000, which is below the average rate by 2·8 and the previous year's rate by 1·0 per 1,000. Among the cases were 73 of influenza, the majority occurring in the Home and North British districts. 285 admissions are recorded for erysipelas, but no death, as compared with 244 cases and 2 deaths in the previous year. 60 cases happened in the Home district; among these 35 occurred in London and 9 at Windsor. Of the cases in London, the brigade surgeon of the Brigade of Guards states that 31 happened at Rochester Row hospital, that the cases chiefly came from Wellington and Chelsea barracks, but there was apparently no sanitary defect likely to produce them. In the Northern district there were 44 cases, 10 at Pontefract, and 8 at York, the remaining 26 cases being scattered over 16 stations. At Aldershot 30 cases occurred, some of them severe. Five cases happened in the North Camp, the remainder in the South Camp and permanent barracks. 30 cases also happened in the Dublin district, 19 being in the city itself. Woolwich follows next with 17 cases, and the Eastern, Southern, Chatham, South-eastern, North British, and Cork districts each with 13 cases, but in no single station was there great prevalence of the disease, Chatham and Shorncliffe having the highest number of cases, 8 and 6 respectively. Of the remaining districts, the Western shows 10 cases, the Curragh 7, the Channel Islands 5, and Belfast 4. Four cases of pyæmia are returned, one at Hounslow, Dublin, Belfast, and Naas respectively. The case at Hounslow proved fatal, but the remainder recovered, though that at Belfast is stated to have been very severe. Mumps caused 80 admissions, more than half of which occurred in the Home and Southern districts. With the exception of 18 cases at Hilsea, and 10 at Lincoln, there was no large number of cases at any individual station. Diphtheria was the cause of 8 admissions and 2 deaths, as compared with 4 admissions and 1 death in the preceding year. Four cases and one death occurred at Aldershot. It is stated by the Principal Medical Officer that the disease was no doubt influenced by the nature of the soil and the (then) defective drainage of the South Camp, where most of the cases occurred. Improvements in the drainage system have since been effected. A fatal case occurred at Shrewsbury. It is believed that the disease was contracted outside barracks. The remaining cases occurred in London, Colchester, and Coventry respectively, and all terminated favourably. A case of fæcy is reported from Weedon, which with two cases of phagedæna from Aldershot and one from Gosport complete the admissions for other diseases of the febrile group.

*Constitutional Group.*—Under this head are shown 18,321 admissions and 151 deaths, which give ratios of 210·3 and 1·71 per 1,000 respectively. The admission rate is slightly higher than that in the preceding year by 5·8 per 1,000, and the death rate is lower by ·30 per 1,000; but compared with the average of the previous six years the increase of admission ratio is 28·4 and of mortality ·56 per 1,000.

The admissions for the various forms of *rheumatism* numbered 4,155, equal to a ratio of 47·7 per 1,000, which is above the average by 7·3 per 1,000, and above the rate for the preceding year by about the same amount. There were 1,627 cases of acute rheumatism, and among them 6 deaths. As in the preceding year, the greatest prevalence of rheumatic affections was in the Eastern district, the ratio being 72·3 per 1,000, followed by Aldershot with 58·7, and by the Home district with 54·9 per 1,000. The lowest rates are found in the Irish and North British districts, being 29·3 per 1,000 in the Belfast district, 34·3 in the North British, 36·9 in the Curragh, and 39·0 per 1,000 in the Cork district. An increase of prevalence of rheumatism has occurred in all the different districts, with the exception of the Southern and Dublin districts, in which a slight decrease is observed. The increase varies from 15·6 per 1,000 in the Eastern district and 14·8 in the Channel Islands to 3·5 in the Chatham district and 2·1 per 1,000 in the North British.



United  
Kingdom.

*Primary syphilis* caused 11,095 admissions to hospital, and secondary syphilis 2,336, being in the ratios of 127·4 and 26·8 per 1,000 respectively. Compared with corresponding ratios in the preceding year, there is an increase of 2·2 in the admission rate for primary syphilis, but a decrease of 3·3 per 1,000 in the rate for secondary disease; and compared with average similar rates for the preceding six years the rate of admission for primary syphilis has increased by 26·6 per 1,000, but that for secondary syphilis has declined by 2·7 per 1,000. The ratio of constantly sick from primary syphilis was 10·21 per 1,000, which is below that of the previous year by ·51 per 1,000, but higher than the average rate of the preceding six years by 2·30 per 1,000; the ratio of constantly sick from secondary disease, 2·10 per 1,000, has declined in both these comparisons, by ·33 in the former and by ·21 per 1,000 in the latter.

Considerable variations in the ratios of prevalence of syphilitic affections are observed in the different districts. Primary syphilis ranges from 189·8 per 1,000 in the Dublin district, to 51·2 per 1,000 in the Cork district. Among the districts showing high rates of prevalence are the Channel Islands 175·7 per 1,000, Aldershot 174·2, Home 172·6, and Chatham 135·8 per 1,000; and among the districts having low rates of prevalence are the North British 94·6, the Western district 98·0, and the Southern district 99·5 per 1,000.

Comparing the ratios of prevalence of primary syphilis in the different districts with those of the preceding year increase is especially noted in the Home district, and equalled 47·7 per 1,000, in the South-eastern district, 41·1 per 1,000, in the Belfast district 24·3 per 1,000, and in the Dublin district 15·0 per 1,000; and decrease is observed principally in the Eastern district, 26·7 per 1,000, in the Curragh 16·5 per 1,000, in the Aldershot district 13·7 per 1,000, and in the Northern district 11·7 per 1,000. In the remaining districts there was no great amount of variation. Compared with the average ratios of prevalence in the different districts for the preceding six years it is found that those of the year under report show increase in 11 instances and decrease in 4. The greatest among the former were 64·4 per 1,000 in the South-eastern district, 62·1 in the Aldershot district, 59·9 in the Chatham district, and 56·4 per 1,000 in the Woolwich district; and among the instances of decrease the greatest were 12·7 per 1,000 in the Curragh (average of 2 years only), 11·3 in the Cork district, and 4·1 per 1,000 in the Northern district.

Secondary syphilis shows the highest rate of prevalence, 39·4 per 1,000, in the South-eastern district, followed by 36·9 per 1,000 in the Home district, and by 35·5 per 1,000 in the Dublin district. The lowest rate of prevalence was 16·1 per 1,000 in the Cork district, the Southern and Curragh districts being next above with 17·4 and 19·0 per 1,000 respectively.

Compared with the returns for the previous year, the greatest increase in prevalence of secondary syphilis in any district was 14·2 per 1,000 in the South-eastern district, and the greatest decrease, 17·1 per 1,000, in the Dublin district; and in comparison with average corresponding rates for the preceding six years, the greatest increase of prevalence was also in the South-eastern district, and was 15·7 per 1,000, but the greatest decrease was 21·6 per 1,000 in the Woolwich district.

Including gonorrhœa and its sequelæ, the ratio of admission for all forms of venereal disease was 275·4 per 1,000, which is higher than that in the previous year by 4·7 and than the average rate for the preceding six years by 33·9 per 1,000. The rate of constant inefficiency from these affections was 19·34 per 1,000, and was fractionally below that in the previous year, but above the average rate by 2·67 per 1,000.\*

*Tubercular Diseases* caused 658 admissions and 139 deaths, being in the ratios of 7·5 and 1·57 per 1,000 respectively. Compared with the previous year it is observed that no change has taken place in the admission ratio, but in the mortality ratio a decline of ·22 per 1,000 has occurred. In comparison with mean rates for the preceding six years there is a decrease in ratio of admission of 2·2 per 1,000 and one of ·51 per 1,000 in that of death.

Phthisis pulmonalis caused 484 admissions and 131 deaths, and tubercular

\* *Note.*—In consequence of the abolition of the Contagious Diseases Acts the special statistics which have been published year by year in the Army Medical Department Reports to show the comparative amount of venereal disease in the stations formerly protected by those Acts and those not so protected are no longer necessary, and are therefore discontinued.

hæmoptysis 132 admissions and 2 deaths. The mortality from tubercular *United* diseases was 21 per cent. of the admissions; and it is also nearly 24 per cent. *Kingdom*. of the deaths from all causes.

The rates of prevalence of tubercular disease vary from 11·1 per 1,000 in the Home district and 10·6 in the Chatham district to 4·5 per 1,000 in the Channel Islands and 4·0 per 1,000 in the North British district. The highest rate of mortality was 2·22 per 1,000 in the Western district, followed by 2·05 in the Curragh; the lowest rate was ·38 per 1,000 in the Aldershot district, the Chatham district being next above, ·88 per 1,000.

Three admissions are recorded for *scurvy* and 12 for *purpura*, or 15 in all, as compared with 21 in the previous year; 4 cases occurred in the Northern district, 2 each in the Southern, Home, Belfast, and Dublin districts, and one case in the South-eastern, Woolwich, and Cork districts respectively.

*Other diseases of the constitutional group* caused 62 admissions and 4 deaths, the ratios of admission and mortality being below the corresponding average rates as well as below those in the previous year. The cases comprised 48 of anæmia, 4 of general dropsy, 6 of diabetes, and 2 of cancer and lupus respectively. Two of the deaths were caused by diabetes, one by general dropsy, and one by rodent ulcer.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused 1,063 admissions and 50 deaths, being in the ratios of 12·2 and ·57 per 1,000 which are slightly higher than the corresponding average rates for the preceding six years and also slightly above the similar rates in the previous year.

The rates of prevalence of nervous affections were highest in the Eastern, Chatham, and Southern districts, being 20·3, 15·3, and 14·8 per 1,000 respectively, while the lowest were 8·3 per 1,000 in the North British district, 8·8 in the Cork district, and 10·2 per 1,000 in the Aldershot district. Increase of prevalence is noted in the Eastern district, 8·4 per 1,000, in the Chatham district 4·8, in the Southern and Channel Islands 3·9 per 1,000, and a decrease of 3·0 per 1,000 is observed in the Cork district; in the remaining districts the variations are not great. Mortality varied from 1·77 per 1,000 in the Chatham district, and 1·34 in the North British district, to *nil* in the Western, Channel Islands, and Belfast districts. The principal causes of admission were neuralgia 406 cases, epilepsy 291, mental affections 194, paralysis 75, and meningitis 30 cases. 18 admissions are recorded for sunstroke. The causes of mortality were encephalitis 1 case, meningitis 22 cases, apoplexy 12, paralysis 4, tetanus 1, epilepsy 1, mania 1, abscess of brain 50, softening of brain 1, tumour of brain 1, and there was one case of cerebral disease (in a man detached from his corps) in which the particular affection was not stated.

*Diseases of the Eye* caused 1,149 admissions, equal to a ratio of 13·2 per 1,000, which is below the ratio for the preceding year as well as below the average ratio by 1·6 per 1,000. The highest rate of prevalence in the different districts was 21·3 per 1,000 in the Channel Islands and the lowest 9·4 per 1,000, in the North British district. In the Dublin, Southern, and Cork districts the ratios of prevalence were high, and in the Chatham and Eastern districts they were low. Increase of prevalence was greatest in the Channel Islands and equalled 8·4 per 1,000, and decrease was greatest in the North British district, being 10·6 per 1,000.

*Diseases of the Ear* show an admission rate of 6·4 per 1,000; this is above the rate in the preceding year by ·4 and above the average rate by ·7 per 1,000. The greatest prevalence of aural affections was 12·3 per 1,000 in the Channel Islands and the least was 3·8 per 1,000 in the North British district.

*Diseases of the Nose* gave a ratio of admission of ·4 per 1,000, which is below the average and below the last year's rate.

The admissions for *diseases of the circulatory system* were 862 in number, and the deaths 36. The ratio of admission was 9·9, and that of death ·41 per 1,000. Compared with the corresponding rates for the preceding year the admission rate has declined by 1·3 and the death rate increased by ·03 per 1,000, but compared with the average similar rates a decrease of 3·9 is observed in the former and one of ·25 per 1,000 in the latter ratio. Among the different districts the highest rate of prevalence, 22·8 per 1,000, is observed in the Eastern district, the South-eastern also having a high rate, 15·6; low rates are found in the

United  
Kingdom.

Northern, North British, Channel Islands, and the Irish districts, the lowest being 5·3 per 1,000 in the Belfast district. Prevalence of these affections has increased in the Eastern and Western districts by 10·7 and 3·7 per 1,000 respectively as compared with the preceding year, and slightly in four other districts, but it has decreased in the remainder, the greatest decline being in the Dublin district, 7·5 per 1,000. With regard to mortality there was none in four districts and in the remainder the rates were fractional, the highest being ·93 per 1,000 in the Belfast district, and the lowest ·13 in the Aldershot district.

The principal causes of admission were palpitation 434 cases, valve disease of heart 245 cases, varicose veins 96 cases, &c. The admissions for palpitation were over 50 per cent., and those for valve disease over 28 per cent., of the total number admitted for diseases of the circulatory system. Of the deaths 13 were due to valve disease of the heart, 4 to pericarditis, 4 to fatty degeneration of the heart, 4 to aneurism of the aorta, 3 to hypertrophy of the heart, 2 to embolism, 2 to syncope, 1 to aneurism of the arteria innominata, 1 to dilatation of the heart, and 2 to cardiac disease, affection not specified, in men absent from their corps.

There were 1,373 admissions for *diseases of the absorbent system*, equal to a ratio of 15·8 per 1,000 of strength, which is higher than that of the previous year by 1·5, and above the average by 3·1 per 1,000. The highest admission ratios in the different districts were 29·5 per 1,000 in the Aldershot district, and 23·3 in the Channel Islands, the lowest ratios were 8·9 in the Western district, and 9·0 per 1,000 in the Cork district. 11 admissions are returned for diseases of the ductless glands, and one death from Addison's disease is reported from Hythe.

*Diseases of the Respiratory System* caused 5,923 admissions and 124 deaths, being in the ratios of 68·0 and 1·40 per 1,000 respectively, the ratio of admission is higher than that in the preceding year by 8·5, but lower than the average rate by 4·1 per 1,000. The ratio of mortality has increased by ·49 as compared with that in the previous year, and by ·11 per 1,000 as compared with the corresponding average rate.

With the exception of the Dublin district and the Channel Islands an increase in rate of prevalence has occurred in all the administrative districts. The highest ratios are found in the South-eastern, Eastern, and Curragh districts, being 100·8, 100·3, and 83·2 per 1,000 respectively, the increase in the Eastern district on the previous year's rate being 28·0 per 1,000, in the South-eastern 37·8, and in the Curragh 22·5 per 1,000. The lowest ratios are found in the Channel Islands, 40·1 per 1,000, in the Belfast district 53·5, and in the Dublin 54·9 per 1,000; the ratios in the Channel Islands and in the Dublin districts have declined by 7·2 and 11·1 per 1,000, and the ratio in the Belfast district has increased by 8·9 per 1,000. The highest mortality rates were 2·80 per 1,000 in the Belfast district, and 2·34 and 2·52 in the Curragh and Home districts respectively; the lowest ratio is observed in the Western district, ·55, the Channel Islands being next above with ·65 per 1,000. Of the admissions 4,662, or over three fourths of the total, were due to bronchial affections, 849, or over 14 per cent., to pneumonia, and 301, or about 5 per cent., to pleurisy. Among the deaths were 89 caused by pneumonia, 17 by bronchitis, 7 by pleurisy, and 2 by laryngitis and œdema of the glottis respectively.

*Diseases of the Digestive System* caused 9,946 admissions and 54 deaths. The ratio of admission, 114·2 per 1,000, is below the corresponding rate in the preceding year by 3·8 per 1,000, but above the similar average rate by 3·0. The ratio of mortality has increased in both these comparisons, in the former by ·18, and in the latter by ·12 per 1,000. The ratios of prevalence in the different districts varied from 149·1 per 1,000 in the Eastern district to 79·3 in the Belfast district. Among districts having high ratios of prevalence are the South-eastern, 145·2, the Aldershot district, 142·4, and the Home district, 140·9 per 1,000; and among those with low ratios may be mentioned the Dublin district, 86·5, the Woolwich district, 88·3, and the Northern district, 91·7 per 1,000. Increase of prevalence has occurred in four districts as compared with the preceding year, the South-eastern, Home, Aldershot, and Curragh districts, the most marked being 27·7 in the Aldershot district, and 22·9 per 1,000 in the Home district; in the remaining districts decrease of prevalence has occurred, amounting to 27·1 per 1,000 in the Dublin district, 21·5 in the Northern district, or 119·2 per 1,000 in the Chatham district. The highest

rates of mortality were 1·20 per 1,000 in the Southern district and 1·12 in the Woolwich district; there was no mortality in the Chatham and Curragh districts, and low ratios, ·18 and ·32 per 1,000, occurred in the Northern and South-eastern districts respectively. Of the admissions 4,439 were due to tonsillitis and 1,599 to dyspepsia, together being more than half, over 60 per cent., of the total admissions for digestive disorders. Among other admissions were 1,120 for affections of the mouth and throat, 781 for diarrhoea, 171 for dysentery, and 617 for hepatic diseases, of which 330, or more than half, were returned as jaundice, and 11 as abscess of the liver. The causes of mortality were abscess of liver 10 cases, hepatitis 9, peritonitis 8, dysentery 7, cirrhosis of liver 5, enteritis 3, atrophy of liver 2, perforation of intestine 2, and gastritis, gastric ulcer, typhlitis, jaundice, sloughing sore throat, intestinal obstruction, hæmatemesis, and peritoneal tumour, one case respectively.

*Diseases of the Urinary System* caused 11,916 admissions into hospital, of these 10,561 were due to gonorrhœa and its sequelæ. The ratio of admission for gonorrhœal affections was 121·2 per 1,000, which is higher than the corresponding rate in the previous year by 5·8, and than that of the average of the preceding six years by 10·0 per 1,000. The highest rates of prevalence were 160·5 per 1,000 in the Dublin district, 148·0 in the Channel Islands, and 129·7 per 1,000 in the Northern district; the lowest rates are found in the Cork, North British, and Curragh districts, 86·6, 98·6, and 101·3 per 1,000 respectively. Compared with the return for the preceding year there is an increase of prevalence of gonorrhœal affections in nine districts and a decrease in the remainder; the principal increase was 35·4 per 1,000 in the South-eastern district, followed by 22·0 per 1,000 in the Curragh district, and 20·9 in the Cork district; decrease is noticed chiefly in the Channel Islands, Chatham, and North British districts, being 54·7, 25·6, and 21·2 per 1,000 respectively.

Other diseases of the urinary system caused 1,355 admissions and 14 deaths, equal to ratios of 15·6 and ·16 per 1,000 respectively, as compared with 14·1 and ·09 per 1,000 in the preceding year, and with average rates of 12·6 and ·15 per 1,000. Among the admissions may be noticed 44 for Bright's disease, of which 11 cases proved fatal. The remaining deaths were two from extravasation of urine, and one returned as cystitis.

*Diseases of the Generative System* caused 801 admissions, being in the ratio of 9·2 per 1,000, which is fractionally above that of the preceding year, but below that of the average of six years by 1·5 per 1,000. The majority of the admissions were due to orchitis.

*Diseases of the Organs of Locomotion* were the cause of 564 admissions. The ratio of admission, 6·5 per 1,000, differs only by a small fractional decrease from the average rate, and by a similar increase on the corresponding rate of the preceding year. More than half the admissions were due to synovitis. Two deaths are returned, one from necrosis and the other from lumbar abscess.

There were 2,418 admissions for *diseases of the cellular tissue*, the ratio per 1,000 being 27·8, which is above the average rate by 4·0, and above the corresponding rate of last year by ·9 per 1,000. Two deaths are returned under this order.

*Diseases of the Cutaneous System* caused 8,165 admissions, the ratio of admission being 93·7 per 1,000, which is below the average rate by 16·2, and below that of the preceding year by 7·8 per 1,000. The prevalence of cutaneous affections varied from 125·8 per 1,000 in the Eastern to 66·6 in the Chatham district. Of the admissions 6,586, or more than two thirds of the total number, were due to itch, ulcers, and boils.

940 admissions are recorded under the head of *debility*, being in the ratio of 10·8 per 1,000, which is fractionally in excess of the average rate and is greater than the rate for the preceding year by 1·1 per 1,000. The greatest number of admissions were in the Home and South-eastern districts. Three deaths are recorded under this head.

*Poisons*.—187 admissions and 13 deaths are returned, being in the ratios of 2·1 and ·15 per 1,000, as compared with 2·7 and ·12 per 1,000 in the previous year, and with average rates of 2·2 and ·11 per 1,000. All the admissions but 7, and 11 of the deaths were due to the abuse of alcohol, 119

United  
Kingdom.

*United  
Kingdom.*

admissions and one death being returned as alcoholic poisoning, and 61, with 10 deaths, as delirium tremens. The ratios of admission for sickness due to alcoholic excess vary considerably in the different districts, the greatest prevalence being in the Chatham and South-eastern districts, and the least in the Woolwich district, the Curragh, and Channel Islands. The remaining admissions for poisons are returned as follows: A case of poisoning by oxalic acid, a man having accidentally drank in the dark a solution prepared for cleaning purposes; a case of poisoning by cantharides, in which it was impossible to determine whether the drug was taken by accident or with suicidal intent; a case of poisoning by pearl ash, accidental; two cases of lead poisoning; one of dog bite; and one of poisoned wound; in all of these recovery ensued. In two instances death occurred from poisoning by cyanide of potassium, taken in one case accidentally, and in the other with suicidal intent. There was also one instance of suicidal poisoning by prussic acid.

*Injuries.*—General injuries caused 9 admissions and 43 deaths as compared with 7 admissions and 25 deaths in the previous year. Six admissions were due to multiple injury, and one to asphyxia from submersion, plugging of air passages, and burn respectively. Of the deaths 6 were due to multiple injury, one man having been run over by a train, one having fallen over some ramparts while asleep, another having fallen over a barrack verandah, 25 feet from the ground, and the remaining 3 cases being those of men who sustained fatal injuries from the accidental explosion of a shell at Shoeburyness. This accident was one of great severity. An officer and a man were killed on the spot, two officers and three men subsequently died of their wounds, one officer and one man were maimed for life, and two others slightly injured. Thirty-four deaths by drowning are recorded, of these 4 were cases of suicide and the remainder accidental; several of them occurred whilst bathing. There was one case of asphyxia by hanging, suicidal, and two cases of asphyxia by crushing, accidental, two boys being buried by a land slip of a cliff at Aldershot, under which they were digging sand.

Local injuries caused 9,292 admissions and 37 deaths, being in the ratios of 106·7 and ·42 per 1,000 respectively, as compared with 111·4 and ·26 per 1,000 in the preceding year, and average ratios for the previous six years of 106·7 and ·31 per 1,000. The admissions were of a very varied nature, but contusions, wounds, and sprains account for more than four fifths of the total number; of the remainder, 428 were due to fractures, 73 to dislocations, 696 to blisters of the feet, 241 to burns or scalds, 47 to gunshot wounds, and 27 to concussion of the brain. Of the deaths, 15 were caused by gunshot wound and were all suicidal; 7 were due to fracture of the skull, of these 5 were accidental, 3 being due to falls, in one case of which a man was walking in his sleep; the other two were homicidal, one man being killed while interfering to stop a fight, and the other being killed by civilians in a fight in the street. Six deaths were due to cut-throat, self-inflicted; one to concussion of the brain, which resulted from a blow of a cricket ball on the right temple; two from wounds, one of which was homicidal, the man receiving a bayonet wound from a comrade who was on sentry, and the other accidental, a recruit having tripped and fell on a bayonet, which pierced his cheek and penetrated the base of his brain. One death occurred from rupture of the lung due to an accident at some field sports, and one from laceration of the brain without fracture of the skull due to a fall down a stone quarry. A death resulted from injury to the spine and another from injury to the head, both from jumping from a window and both suicidal while suffering from delirium tremens; and one death was due to a wound of abdomen with protrusion of intestine, consequent on being crushed by the fall of a gun.

Five deaths are returned under the head of *cause unknown*, being cases of which either no record or insufficient information has been furnished. Three occurred among men detached from their corps, in two instances no record of the cause is given, and in the third it is stated to have been hæmorrhage, but no particulars are given; the fourth case is that of a man who died on board ship on passage between Guernsey and Jersey, probably from heart disease, and the fifth a case of sudden death in a recruit, in which the only record of the cause of death is the verdict of the coroner's jury, that it was "over-eating with abnormal voracity."

The total number of *suicides* among the troops serving at home was 30, equal to a ratio of  $\cdot 34$  per 1,000 of strength, which is double that recorded in the preceding year. The mode of suicide was gunshot wound in 15 cases, cut throat in 6, drowning in 4, poison in 2, jumping from height in 2, and hanging in one case. No motive for the act was discovered or could be assigned in 18 instances, in 6 it was attributable more or less directly to drink, and in 2 to domestic troubles, pecuniary difficulties, and mental despondency respectively. A verdict of suicide while in a state of temporary insanity was returned in most instances; but in one case an open verdict was returned and in another no record is given. The average age of the suicides was 29 years, and their average length of service 9 years. Self-inflicted wounds of the throat, which resulted in recovery, occurred in four instances, in one case the act is said to have been due to drink, in two to mental aberration, and one man inflicted on himself a gunshot wound of the cheek, it is believed through anger and disappointment at not being promoted.

*Surgical Operations.*—Among the operations performed during the year may be mentioned an amputation of the forearm, on account of a fibro-plastic tumour, with satisfactory result; two amputations of the thigh, about the middle and upper third, and one amputation of the leg, all on account of severe injuries received in the shell explosion at Shoeburyness above mentioned, the two former cases died, but the latter recovered with a fair stump. In addition to the above there were many cases of minor amputations, of thumbs, fingers, and toes, from various causes, in all of which satisfactory results were obtained. Excision of the eyeball, on account of disease, was performed in two instances, and an operation for strabismus in one instance, all of these were successful. Of eight cases of paracentesis thoracis on account of empyema successful results were obtained in five, but death ensued in two; in the remaining case the operation was satisfactory but the patient sank 20 days afterwards from bronchitis. Two cases of tracheotomy are recorded, both with fatal result, in one case the operation was necessitated by laryngitis, and in the other by gunshot wound of mouth and throat; in the latter death took place four hours after operation from rapid œdema of the lungs and inflammation of the air passages. A case of aspiration, and afterwards incision, of an abscess of the liver also eventually had a fatal issue. Excision of the lower lip on account of epithelial cancer was practised in one case; the case did well and the man was invalided. A successful case of trephining on account of disease of the mastoid cells is recorded. Two cases of extraction of bullets from accidental gunshot wounds, and one of ligature of the brachial artery on account of wound, were all successful. The remainder comprised operations for fistula in ano, removal of tumours, varicocele, &c., in all of which satisfactory results were obtained.

*Invaliding.*—The number of men discharged the service by invaliding during the year was 1,909, being in the ratio of  $21\cdot 61$  per 1,000, as compared with  $20\cdot 89$  in the preceding year, and with the decennial average rate  $25\cdot 48$  per 1,000.

The principal causes of invaliding, taking them in order of frequency, were diseases of the circulatory system 321 cases, equal to  $3\cdot 63$  per 1,000 of strength; diseases of the nervous system 305 cases, or  $3\cdot 45$  per 1,000; tubercular diseases 287 cases, or  $3\cdot 25$  per 1,000; debility 175 cases, or  $1\cdot 98$  per 1,000; diseases of the digestive system 148 cases, or  $1\cdot 68$  per 1,000; injuries 110 cases, or  $1\cdot 24$  per 1,000; rheumatism 96, or  $1\cdot 09$  per 1,000; and diseases of the organs of locomotion, 89 cases, or  $1\cdot 01$  per 1,000. In all other orders of diseases the ratios of invaliding is either fractional or *nil*. Compared with the returns for the preceding year it will be observed that the principal causes of invaliding are the same, and are nearly in the same order of frequency. Comparing the different invaliding ratios in the two years no great difference is observed in any, the most marked being an increase of  $\cdot 52$  per 1,000 in invaliding for tubercular diseases, and  $\cdot 19$  per 1,000 for injuries also a decrease of  $\cdot 41$  per 1,000 for diseases of the circulatory system.

Dividing the invaliding into quinquennial periods of service it is found that 1,148 men were invalided in the first five years of service, which is equal to a ratio of  $18\cdot 96$  per 1,000, calculated on a strength of 60,536 (taken from a table in the General Annual Return of the Army for 1885,

*United Kingdom.*

*United  
Kingdom.*

showing the number of men at different years of service); from five to 10 years' service, strength being 14,362, the number of men invalided was 325, or 22·63 per 1,000; from 10 to 15 years' service, strength 5,681, the number invalided was 122, or 21·47 per 1,000; from 15 to 20 years' service 244 were invalided, or 35·07 per 1,000, strength being taken as 6,958; and over 20 years' service 70 were invalided, or 30·25 per 1,000, strength being 2,314. Compared with similar information for the preceding year an increase has occurred in the invaliding under five years' service and over 20 years' service, and a decrease is observed in invaliding in the other quinquennial periods. The rates of invaliding in the later periods of service are highest owing to the number of old soldiers discharged in this manner out of a comparatively small strength. Out of the total number invalided 60 per cent. were in the first five years of service, 17 per cent. in the second quinquennial period, 6 per cent. in the third, 13 in the fourth, and 4 per cent. over 20 years' service

Examining into invaliding in the first year of service, and taking the strength as 23,960, it is observed 444 men were discharged as invalids, which gives a ratio of 15·33 per 1,000, being slightly higher than the corresponding ratio in the preceding year. Of the total number invalided the per-centage invalided in the first year of service was 23, being the same as in the previous year. Among the chief causes of invaliding in the first year of service were heart disease, epilepsy, mental disease, and phthisis pulmonalis. Comparing the relative prevalence of invaliding from each of these causes in the first year of service with that in the whole period of service it is observed that in invaliding from heart disease there is not much difference in the ratios, that of the first year being 2·86, and that of total service 2·87 per 1,000. In the case of epilepsy invaliding in the first year was 1·38, and in total service 1·14 per 1,000. Invaliding on account of mental disease was relatively more prevalent in the first year than in total service, the ratios being 2·69 and 1·70 per 1,000 respectively. With regard to phthisis pulmonalis the rate of invaliding to strength in total service was 3·01 per 1,000, and in the first year of service only ·93 per 1,000.

The following were the rates of invaliding at different ages (calculated on strengths at the various ages compiled from a table in the return above mentioned):—The strength of men under 20 years being, taken as 24,538, and the number invalided being 260, the rate of invaliding was 10·60 per 1,000; from 20 to 25 years the rate was 21·27 per 1,000, strength being 36,005, and number invalided 766; from 25 to 30 years the rate was 27·56 per 1,000, the number invalided being 398, and the strength being 14,443; over 30 years but under 35 years 159 men were invalided, the strength being 6,996, the ratio, therefore, was 22·73 per 1,000; over 35 years but under 40, strength 6,104, there were 245 invalided, or 40·14 per 1,000; and over 40 years 81 men were invalided, strength being 1,766; the rate of invaliding was, therefore, 45·87 per 1,000. Compared with the return for the preceding year the rate of invaliding has increased in the year under report in all the quinquennial periods of age, except in the periods 30 to 35 years, and over 40 years of age. The invaliding under 20 years of age was at the rate of 14 per cent. of total number invalided; that between 20 and 25 years 40 per cent., between 25 and 30 years 21 per cent., between 30 and 35 years 8 per cent., between 35 and 40 years 13 per cent., and over 40 years 4 per cent.

The admissions, deaths, and average number constantly sick in the various military districts are shown in the following table:—

Military Districts.	Average Annual Strength.	Admitted into Hospital.	Died.	Average Number constantly Sick.	Ratio per 1,000 of Mean Strength.			Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
					Admitted to Hospital.	Died.	Constantly Sick.		
1. Northern -	11,345	9,456	71	443·47	833·5	6·27	39·09	14·27	17·12
2. Eastern -	4,038	4,167	26	225·60	1031·9	6·44	55·87	20·39	19·76
3. Western -	5,410	4,549	31	256·11	840·9	5·73	47·34	17·27	20·54
4. Southern -	7,475	6,501	54	346·46	869·7	7·22	46·35	16·92	19·45
5. Chatham -	3,395	2,781	20	164·25	819·1	5·89	48·38	17·65	21·55
6. South-eastern -	6,267	6,240	32	340·13	995·7	5·11	54·27	19·81	19·89
7. Home -	7,948	8,184	61	439·84	1029·7	7·68	55·34	20·20	19·62
8. Woolwich -	4,463	3,507	25	261·35	785·8	5·60	58·56	21·37	27·20
9. Aldershot -	7,852	7,680	43	461·43	978·1	5·47	58·77	21·45	21·93
10. North British -	3,732	2,810	30	134·56	752·9	8·04	36·05	13·16	17·47
11. Channel Islands	1,548	1,434	9	72·45	926·4	5·81	46·80	17·08	18·44
12. Belfast -	3,215	2,383	25	116·47	741·2	7·77	36·23	13·22	17·84
13. Dublin -	8,668	7,842	56	494·23	904·7	6·46	57·02	20·81	23·00
14. Cork -	8,335	5,959	46	284·32	714·9	5·52	34·11	12·45	17·41
15. Curragh -	3,414	2,933	21	180·99	859·1	6·15	53·01	19·35	22·52
Detached from the Corps.	1,226	—	40	—	—	32·63	—	—	—
Total -	88,331	76,426	590	4,221·66	877·4	*6·68	48·46	17·69	20·16
Average of 10 years, 1875-84.	—	—	—	—	843·0	7·20	43·79	15·98	18·96

United Kingdom.

\* Calculated on strength, including men detached.

In this table it is observed that the highest ratio of admission to hospital per 1,000 of mean strength occurred in the Eastern district, and reached 1031·9 per 1,000, and the lowest rate, 714·9 per 1,000, occurred in the Cork district. Between these two are the remaining districts with varying rates, among the higher being the Home, South-eastern, and Aldershot, districts, with 1029·7 and 978·1 per 1,000 respectively; and among the lower being the Belfast district, 741·2, the North British, 752·9, and the Woolwich district, 785·8 per 1,000. The highest rate of mortality is found in the North British district, 8·04 per 1,000, and the lowest 5·11 per 1,000 in the South-eastern district. Comparatively high rates are also observed in the Belfast, Southern, and Home districts. The highest ratio of constant inefficiency through sickness is found in the Aldershot district, and equalled 58·77 per 1,000; this is closely followed by the Woolwich district with 58·56 per 1,000, and the Dublin district with 57·02 per 1,000; the lowest ratio of constantly sick occurred in the Cork district, and was 34·11 per 1,000; the ratios for the North British and Belfast districts being just above, 36·05 and 36·23 per



United  
Kingdom.

1,000 respectively. The longest average sick time to each soldier was 21·45 days in the Aldershot district, and the shortest 12·45 days in the Cork district. The average duration of each case of sickness was longest in the Woolwich district, 27·20 days, and shortest in the Northern district, 17·12 days.

The following table, compiled from the returns of Principal Medical Officers, shows the admissions, deaths, number of men invalided, and number constantly sick, from each arm of the service, with the ratios per 1,000 of the strength and the corresponding ratios for the previous 10 years :—

Arms of the Service.	Average Strength.	Admitted into Hospital.	Died.	Discharged as Invalids.	Average Number Constantly Sick.	Annual Ratios per 1,000 of Strength.				Average of 10 Years. 1875-84.			
						Admitted.	Died.	Invalided.	Constantly Sick.	Admitted.	Died.	Invalided.	Constantly Sick.
Household Cavalry	1,271	988	3	38	54·91	777·3	2·36	29·89	43·20	644·1	4·25	21·00	26·03
Cavalry -	9,057	8,710	50	221	481·57	961·7	5·52	24·49	53·17	924·5	5·89	30·92	37·60
Royal Artillery -	15,326	12,306	101	373	752·92	802·9	6·59	24·33	40·12	770·5	7·94	25·36	32·81
Royal Engineers -	2,620	1,910	29	56	108·44	729·0	11·06	21·37	41·38	584·2	7·08	17·84	30·32
Foot Guards -	4,584	5,269	46	146	317·18	1149·4	10·03	31·85	69·19	952·7	7·08	22·93	40·03
Infantry -	35,380	32,692	206	671	1829·56	924·0	5·82	18·96	51·71	861·2	6·74	28·98	35·03
Regimental Depôts	14,338	10,996	109	283	454·06	703·9	7·60	19·73	31·68	877·2	11·02	32·63	33·41
Garrison Staff and Departments.	4,529	3,555	46	87	223·02	784·9	10·15	19·20	49·24	571·5	7·96	14·82	35·75

\* For eight years only.

† For six years only.

From the above table it is observed that the highest admission rate occurred in the Foot Guards, 1149·4 per 1,000, and the lowest, 729·0 per 1,000, in the Royal Engineers. The rate of mortality was highest in the Royal Engineers, being 11·06 per 1,000, and lowest in the Household Cavalry, 2·36 per 1,000. The highest ratio of invaliding, 31·85 per 1,000, is found in the Foot Guards, but it is closely followed by the Household Cavalry with 29·89; the lowest ratio, 18·96 per 1,000, occurred in the infantry. The highest ratio of constantly non-effective through sickness is observed in the Foot Guards, 69·19 per 1,000, and the lowest ratio of inefficiency from this cause in the Regimental Depôts. In the previous year as well as in the average of the 10 preceding years, the highest rates of admission and constantly sick were also found in the Foot Guards, but while the lowest admission rate was in the Engineers in the previous year and the year under report, it is found in the Garrison Staff and Departments in average rates. Mortality in the preceding year was, as in the year under report, highest in the Royal Engineers, and highest in Regimental Depôts in the average rates; the lowest average mortality rate was in the Household Cavalry as it also was in the preceding year. Invaliding was highest in the Household Cavalry in this and the preceding year, but on the average is highest at Regimental Depôts, and is lowest in the Garrison Staff and Departments, as was also the case in the previous year.

Compared with the results for the preceding year a decrease of admission has occurred in the Infantry and Regimental Depôts, but an increase in all other arms of the service. Mortality has declined in the Household Cavalry and Regimental Depôts, but has increased in the remaining arms. Invaliding increased in all the arms of the service except the Infantry and Regimental Depôts, in which it declined. The constantly sick rate declined in the Infantry and Regimental Depôts, but increased in all other arms of the service. In comparison with decennial average rates the ratio of admission has increased in all arms of the service except the Regimental Depôts. The mortality rate has increased in the Royal Engineers, Foot Guards, and Garrison Staff and

Departments, but has declined in the remaining arms. Invaliding has increased in the Household Cavalry, Engineers, Foot Guards, and Garrison Staff and Departments, but has decreased in other arms; and the ratio constantly sick has increased in all arms except Regimental Depôts. United Kingdom.

In Abstract P. will be found tables showing the attacks of illness and deaths in the different classes and orders of diseases, among officers, women, and children during the year, compiled from the annual returns of Principal Medical Officers of districts.

**OFFICERS.**—The average strength, as gathered from the annual returns, was 3,160, the number of attacks of illness recorded was 922, and the number of deaths 24. The rate of prevalence of sickness was, therefore, 291·8 per 1,000, which differs only from the corresponding rate in the preceding year by a decline of 7·5 per 1,000, while the rate of mortality shows an increase of 3·52 on the rate in 1884 and reaches 7·60 per 1,000.

In the *febrile group* of diseases 88 attacks of illness are recorded, equal to a rate of 27·8 per 1,000, an increase of 1·8; while there were 3 deaths, or ·95 per 1,000, as compared with *nil* in the preceding year. *Eruptive Fevers* caused 8 illnesses, including 5 attacks of measles and 1 of scarlet fever. Nine attacks of *enteric fever* are recorded, equal to 2·8 per 1,000, as compared with 6 in the previous year. Three of the cases, one being fatal, occurred in Dublin, where, as has been already shown, several cases occurred among the men; two happened at Gosport, of which it is thought defective drainage may have been the cause; two at Portsmouth and one at Hythe—in these the cause is not recorded; and one at Chatham, said to have been due to sewer gas. *Other continued fevers* show 29 illnesses, or 9·2 per 1,000, and one death; the rate of prevalence shows a slight decline. *Paroxysmal fevers*, on the other hand, were at the rate of 9·5 per 1,000, as compared with 5·5 in 1884; one death occurred from remittent fever. Among 12 cases of other febrile diseases were four of erysipelas, all of which did well.

In the *constitutional group* of diseases 91 attacks of illness occurred, equal to 28·8 per 1,000; of these 80 were due to *rheumatic* affections, being 25·3 per 1,000, slightly above the rate in 1884; the acute form of the disease caused 18 of the cases, and there were two deaths. Among other affections of this group were three cases of syphilis, four of hæmoptysis, two of anæmia, and two, fatal, of cancer.

**Local Diseases.**—*Affections of the Nervous System* caused 32 attacks of illness, equal to 10·1 per 1,000, a decline of 1·0 from the rate in the previous year. Three fourths of the cases were due to neuralgia; and among the remaining cases were two of apoplexy and one of meningitis, all fatal. Five cases of affections of the circulatory system are shown, also five deaths, the causes of the latter being valve disease of the heart in two instances, and aneurism in the remainder.

**Respiratory Diseases** caused a rate of prevalence of 42·4 per 1,000, as compared with 38·2 in the previous year. Bronchial affections caused most of the illness, and there was one death from bronchitis. Pneumonia shows eight attacks and two deaths.

**Diseases of the Digestive System** declined from 61·8 in the preceding year to 58·5 per 1,000. The principal causes of illness were tonsillitis, dyspepsia, hepatic affections, and diarrhoea. One death only is recorded, from typhilitis. Among *urinary affections*, more than half were due to gonorrhoea and its sequelæ, and of the remainder none call for mention except one case of Bright's disease. The rates of prevalence of the remaining orders of local disease do not differ much from those in the preceding year.

The number of instances of *injury* was 201, being at the rate of 63·6 per 1,000, which differs only fractionally from the corresponding rate in the previous year. Sprains, contusions, wounds, and fractures were the principal injuries. Three officers were killed or died of their wounds in the shell explosion at Shoeburyness, already described; one officer died from fracture of the skull at Alderney, caused by a fall from a dogcart, and one, seven miles from Maidstone, by a fall while hunting.

**WOMEN.**—The average strength of women, taken from the annual returns, was 8,825; the number of attacks of illness, exclusive of cases of ordinary parturition, 3,330; and the number of deaths, 67. The rate of prevalence of sickness was, therefore, 377·3 per 1,000, and that of mortality 7·59 per 1,000.

United  
Kingdom.

Compared with the corresponding rate for the previous year, an increase of 28·1 is observed in the former, and one of ·42 per 1,000 in the latter.

*Diseases of the Febrile Group* caused 174 attacks of illness, equal to a rate of 19·7 per 1,000, which is greater than that in 1884 by 1·2 per 1,000. Four deaths are returned, equal to ·46 per 1,000, a decline of ·19 per 1,000. Among 39 cases of *eruptive fevers* there were two of small-pox, both of which occurred at Woolwich, and both recovered. Of the remaining cases, 31 were due to measles, and six to scarlet fever, scattered over different stations. Two women died from scarlet fever, and one from measles. Three attacks of *enteric fever* are recorded, one at Gosport, one at Clonmel, and one in the Northern district; no death occurred, and the number of cases compares favourably with 10 attacks and one death in the previous year. *Other continued fevers* caused a rate of attack of 6·2 per 1,000, the same as in the preceding year; but the rate of attack of *paroxysmal fevers*, 4·1, has increased in this comparison by ·8 per 1,000. *Other febrile diseases* caused 41 illnesses, among which were two cases of puerperal fever, two of puerperal ephemera, three of diphtheria, 23 of erysipelas, and one of pyæmia, of which the last-named case proved fatal.

In the *constitutional group* of diseases 340 attacks of illness are recorded and 28 deaths, being in the rates of 38·6 and 3·17 per 1,000 respectively. In the former, as compared with the report for the previous year, an increase of 5·4 is observed, and one of ·45 per 1,000 in the latter. The increase in rate of prevalence is almost entirely due to *rheumatism*, some form of which caused 177 attacks, or 20·1 per 1,000; 75 of the cases are returned as rheumatic fever, of which one case terminated fatally.

*Tubercular Diseases* show 80 attacks of illness and 25 deaths, equal to 9·1 and 2·83 per 1,000 respectively, the admission rate being slightly below and the death rate slightly above the corresponding rate in the previous year. 64 of the cases and 24 of the deaths were due to phthisis pulmonalis. Among 66 cases of *other constitutional diseases* were two of diabetes, two of general dropsy, one fatal case of cancer, and the remainder were cases of anæmia, one of which had a fatal issue.

*Local Diseases.*—*Diseases of the Nervous System* caused 187 attacks of illness and two deaths, being in the ratios of 21·2 and ·22 per 1,000, the former being a little above and the latter a little below the corresponding rate in the previous year. Most of the cases were neuralgic or hysterical affections, and there were a few cases of epilepsy and of mental affection, &c. One of the deaths is recorded as due to vertigo, and the other to paralysis.

The rate of prevalence of *affections of the circulatory system*, 5·0 per 1,000, shows a decline of 3·2. A diminution in the frequency of cases of palpitation is noticed, and to some extent in valvular disease. A death from embolism is returned.

*Respiratory Diseases* caused 600 illnesses, equal to 68·0 per 1,000, an increase of 13·0 on the rate for the previous year; the mortality rate, 1·24 per 1,000, caused by 11 deaths, also shows an increase. Bronchial affections caused more than five sixths of the attacks, and among the remaining cases were 22 of asthma, 21 of pleurisy, and 19 of pneumonia. Of the deaths 7 are referred to bronchitis, and 4 to pneumonia.

In *diseases of the digestive system* the rate of prevalence, 93·8 per 1,000, shows an increase, amounting to 8·1; and the ratio of mortality, 1·36 per 1,000, caused by 12 deaths, is increased by 1·03 as compared with the record in the foregoing year. By far the most numerous affections were tonsillitis, dyspepsia, and diarrhoea, these alone amounting to 571 cases of the total 828. There were also 41 cases of hepatic disease, with two deaths; 17 of peritonitis, of which 6 were fatal; and 15 of dysentery. The remaining deaths were due to diarrhoea, two cases, and enteritis and ascites, one case respectively.

*Urinary Diseases* were very infrequent, but four cases of Bright's disease are recorded, of which one proved fatal.

*Diseases of the Generative System* were numerous, but the rate of prevalence, 38·4 per 1,000, shows a decline of 5·3 as compared with the previous year's record. Among the cases were 79 of abortion, 26 of metritis, 10 of hæmorrhage, 10 of premature labour. There were six deaths, three being due to metritis or metro-peritonitis, and one to ovarian tumour, abortion, and childbirth respectively. The remaining orders of local disease differ very slightly, as regards rate of prevalence, as compared with the records in the preceding year.

*Debility* shows 543 cases, equal to a rate of 61·5 per 1,000, somewhat higher than in the year 1884. Two deaths are returned under this head.

*United Kingdom.*

Two cases are recorded under the class of *poisons*, one was a case of delirium tremens, and the other one of poisoning by coal gas; both recovered.

*Injuries* of a local nature numbered 49, or 5·6 per 1,000, mostly contusions, wounds, and sprains, and of a simple character.

**CHILDREN.**—The average strength of children as gathered from the annual returns was 16,112, the number of attacks of illness 7,230, and of deaths 412. The rate of prevalence of sickness among children was, therefore, equal to 448·7 per 1,000, and that of mortality to 25·57 per 1,000; the former shows an increase of 18·9, and the latter a decrease of 2·06 per 1,000 as compared with the corresponding ratios for the preceding year.

2,307 attacks of illness and 68 deaths due to diseases of the *febrile group* are returned, being in the respective ratios of 143·1 and 4·22 per 1,000 as compared with 123·2 and 4·23 per 1,000 in the year 1884. *Eruptive fevers* were in the ratio of 98·0 per 1,000, which is a considerable increase, due to the general prevalence of measles. The rates of prevalence of and mortality from this disease, which in 1883 were 37·7 and ·57 per 1,000, and which increased in 1884 to 60·9 and 1·04 per 1,000, still further rose in the year under report to 80·2 and 1·92 per 1,000 respectively. Scarlet fever, on the other hand, with rates of attack and mortality equal to 8·3 and ·68 per 1,000 declined as compared with the preceding year by 6·1 and ·60 per 1,000. Three cases of small-pox occurred, two at Woolwich, one being fatal, and one at Bedford. *Enteric fever* caused 16 attacks and 2 deaths, against 4 attacks, none fatal, in the foregoing year. Of these 13 cases, including one with fatal result, occurred in Dublin alone; the remaining 3 at Beverley, Devonport, and Netley respectively, that at Beverley being fatal. *Other continued fevers* were at the rate of 16·1 per 1,000, and caused two deaths. *Paroxysmal fevers* occurred only in 23 instances, 1·4 per 1,000, and all recovered. *Other febrile diseases* were 429 in number, with 20 deaths, the rate of prevalence 26·6 per 1,000, being increased, and that of mortality, 1·25 per 1,000, slightly decreased as compared with last year's return. Whooping cough alone shows 299 attacks, equal to 18·5 per 1,000, and 15 children died from this disease. Diphtheria attacked 28 children, of whom 5 died. The greatest incidence of this disease was at Aldershot, where 17 cases but only one death occurred; there were 3 cases at York, all of which recovered, two at Colchester, both fatal, two at Manchester, one fatal, and one at Preston, fatal; there were also single cases, recoveries, at Portsmouth, London, and Woolwich. Diphtheria has been more frequent, but less fatal, than in the preceding year, when out of 19 cases 8 died, the mortality to attacks in the year under report having fallen to 18 per cent. 81 cases of mumps, and 12 of erysipelas are returned, but there was no death.

In the *constitutional group* of diseases there were only 211 cases of sickness, or 13·1 per 1,000; but there were 47 deaths, or 2·92 per 1,000, which ratios are close to, though a little above, those recorded in the preceding year. *Rheumatism* shows 23 attacks, 19 being of the acute form, but no death. There were 15 cases of syphilitic affection, 23 of anæmia, 19 of rickets, and 3 of general dropsy, but the remainder of the cases, 128, were *tubercular diseases*, among which were 39 deaths, and the ratio of prevalence, 8·0 per 1,000, has decreased slightly compared with the foregoing year, while that of mortality has slightly increased. The principal tubercular diseases were scrofula, which caused 3 deaths, tubercular meningitis 16 deaths, tabes mesenterica 16, and phthisis pulmonalis and acute miliary tuberculosis 2 deaths respectively. The remaining deaths from constitutional affections were 5 from hereditary syphilis and 3 from general dropsy.

**Local Diseases.**—*Affections of the Nervous System* show 215 cases and 81 deaths, being in the ratios of 13·3 and 5·03 per 1,000 respectively. The admission rate is almost identical with that of the previous year, but there is a slight decline in the death rate. The greatest number of attacks and deaths were due to convulsions, being 133 and 56 respectively. Meningitis shows 41 cases and 19 deaths, chorea 16 cases, epilepsy 9, &c. The remaining deaths recorded were due to epilepsy, cerebral atrophy, hydrocephalus, spinal atrophy, and chorea one case respectively. There are only 12 cases of *diseases of the circulatory system* returned, of which five were cases of valve

United  
Kingdom.

disease of the heart and three of palpitation. A death is returned from syncope.

*Diseases of the Respiratory System* were very frequent, the attacks numbering 2,041 and the deaths 124, equal to rates of 126·7 and 7·69 per 1,000 respectively. Compared with similar rates in the previous year an increase of 16·3 per 1,000 is observed in the former, and one of 1·32 in the latter. Bronchial affections caused 1,900 of the illnesses, and there were 96 cases of pneumonia, 34 of croup, and 3 of pleurisy. Of the deaths, 82 were due to bronchitis, 23 to pneumonia, 15 to croup, and 2 to pleurisy. The attacks of illness due to *diseases of the digestive system* were also numerous, amounting to 1,177, among which there were 52 deaths, the ratios per 1,000, however, 73·1 and 3·23 respectively, compare favourably with 85·8 and 4·23 in the preceding year. The cases of diarrhœa, tonsillitis, teething, and dyspepsia were very numerous. The causes of death were diarrhœa 29 cases, teething 11, tonsillitis 4, gastritis 3, and enteritis, peritonitis, and intestinal obstruction, one case respectively.

*Diseases of the Urinary and Generative Systems and of the organs of locomotion* caused very little sickness, but one death occurred from renal disease. *Cutaneous affections* were frequent, eczema and tinea being the most prevalent disorders. The rate of prevalence of skin diseases, 25·3 per 1,000, shows a slight decline.

Under the head of *conditions* are recorded 322 cases of debility and 24 deaths, also six instances of premature birth, all of which died. *Poisons* are represented by a single case of wasp sting.

*Injuries* of a local character numbered 233, the same as in the preceding year, they were chiefly caused by wounds, contusions, burns, and scalds, and fractures. Three deaths were caused by burns and scalds, and one by fracture. There were also three deaths by drowning.

---

## VACCINATION.

The following table shows the conditions as to vaccination of all recruits *United* found fit for the service during the year, together with the proportion per *Kingdom*. 1,000 of each condition :—

1885.	Number of Recruits found fit for the Service.	Proportion per 1,000.
Had marks of vaccination - -	39,952	922
Had marks of small-pox - -	992	23
Had neither marks of vaccination nor marks of small-pox - - }	2,372	55
Total - -	43,316	1,000

As compared with the results for the previous year an increase of 5 per 1,000 is observed among recruits bearing marks of vaccination, a decrease of 5 among those bearing marks of small-pox, and an increase of 2 per 1,000 among those bearing neither marks of small-pox nor of vaccination.

The following tables, compiled from the annual returns of Principal Medical Officers, show the number of vaccinations performed during the year, with the proportions per 1,000 of successful or modified results or of failures, whether vaccinated with fresh or preserved lymph.

United  
Kingdom.

Results.	Vaccinated during the year.						Proportion per 1,000.					
	Arm to Arm.		From Preserved Lymph.		Total.		Arm to Arm.		From Preserved Lymph.		Total.	
	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.	Primary Vaccination.	Re-Vaccination.
<b>TABLE I.—<i>Recruits.</i></b>												
Perfect vaccine pustules	102	5,653	264	10,941	366	16,600	703.4	533.9	539.9	437.1	577.3	465.9
Modified vaccine pustules	29	3,171	106	7,250	135	10,421	200.0	299.2	216.8	289.7	212.9	292.5
Failures	14	1,769	119	6,839	133	8,608	96.6	166.9	243.3	275.2	209.8	241.6
Total	145	10,599	489	25,030	634	35,629	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
<b>TABLE II.—<i>Soldiers other than Recruits.</i></b>												
Perfect vaccine pustules	9	133	26	277	35	410	813.2	382.3	553.2	414.1	603.4	406.8
Modified vaccine pustules	2	124	12	204	14	328	181.8	365.8	255.3	304.9	241.4	325.4
Failures	—	82	9	188	9	270	—	241.9	191.5	281.0	155.2	267.8
Total	11	339	47	669	58	1,008	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
<b>TABLE III.—<i>Soldiers and Recruits.</i></b>												
Perfect vaccine pustules	111	5,792	290	11,218	401	17,010	711.5	529.5	541.0	436.5	579.5	464.3
Modified vaccine pustules	31	3,296	118	7,454	149	10,749	198.7	301.2	220.1	290.1	215.3	293.4
Failures	14	1,851	128	7,027	142	8,878	89.8	169.3	238.9	273.4	206.2	242.3
Total	156	10,938	536	25,699	692	36,637	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0

The first table shows the vaccinations performed on recruits only, the second those on soldiers other than recruits, and the third comprises both the foregoing or the total amount of vaccination among soldiers. *United Kingdom.*

The total number of men vaccinated during the year was 37,329, as compared with 35,797 in the preceding year. The number of recruits vaccinated was 36,263, showing an increase of 2,933, while the number of soldiers, other than recruits, vaccinated was 1,066, a decrease of 1,401. The number of recruits found fit for the service was 43,316; it would appear, therefore, that the vaccination of 7,053 recruits is not accounted for. Of these, however, some were recruits who joined from the Militia, and who, having been satisfactorily vaccinated in that force, did not require re-vaccination on joining the regular army, and some were recruits enlisted late in the year whose vaccination will appear in the returns of the following year.

Comparing the results of vaccination of recruits with those recorded for the previous year it is observed that in arm to arm primary vaccination a decrease of 29.5 per 1,000 has taken place in the proportion of perfect vaccine pustules, and an increase of 12.5 and 17.0 per 1,000 respectively in the proportion of modified vaccine pustules and of failures. In arm to arm re-vaccination a decrease of 65.1 per 1,000 has occurred in modified results, but an increase of 60.3 in perfect results, and one of 4.8 per 1,000 in failures.

In primary vaccination with preserved lymph a decrease of 107.0 per 1,000 has taken place in the proportion of modified vaccine pustules, but this is counterbalanced by an increase of 87.3 and one of 19.7 per 1,000 in perfect results and failures respectively. In re-vaccination an increase of 36.3 per 1,000 is observed in the proportion of perfect vaccine pustules, while modified results and failures are decreased by 13.3 and 23.0 per 1,000 respectively.

Taking the total results of primary vaccination amongst recruits the proportion of perfect results is observed to have increased by 70.7, and of failures by 14.0 per 1,000, while modified results have declined by 84.7 per 1,000. The total results of re-vaccination show an increase of 38.2 per 1,000 in the proportion of perfect vaccine vesicles, and a decrease of 33.1 and 5.1 per 1,000 respectively in modified vaccine vesicles and failures.

In Table II., soldiers other than recruits, it is observed that arm to arm primary vaccination was rarely necessary, and primary vaccination with preserved lymph occurred only in 47 cases. Arm to arm re-vaccination as compared with results in the previous year shows an increase of 175.5 per 1,000 in the proportion of perfect vaccine pustules, with a decrease of 115.1 per 1,000 in modified pustules, and one of 60.4 per 1,000 in failures. In re-vaccination with preserved lymph an increase of 134.3 per 1,000 has taken place in the proportion of perfect vaccine vesicles; those of modified vesicles and failures having declined by 25.5 and 108.8 per 1,000 respectively. The total of both forms of re-vaccination shows an increase of 154.6 per 1,000 in the proportion of perfect results, counterbalanced by a decline of 70.9 in modified results and one of 83.7 per 1,000 in failures.

Table III. shows the total results of primary vaccination in all classes of soldiers as compared with those of the foregoing year to be as follows:—A decrease in the proportion of modified vaccine pustules equal to 81.5 per 1,000, with an increase of perfect vesicles equal to 74.6 per 1,000, and one of failures equal to 6.9 per 1,000. In re-vaccination an increase of 49.0 per 1,000 is seen in perfect results, the decline in modified results being 37.2 and in failures 11.8 per 1,000.

*Women.*—Two cases only of primary vaccination are recorded, and 122 of re-vaccination. Of the latter, the results were perfect vesicles 663.9, modified vesicles 188.5, and failures 147.6 per 1,000 operations. Compared with the return for the previous year, an increase of 121.6 per 1,000 is observed in perfect results, with a decrease of 67.7 in modified results, but there is a decrease of 54.9 per 1,000 in failures.

*Children.*—Out of 1,437 arm to arm primary vaccinations, 1,404 cases gave perfect results, the balance, 33, being failures, being in the proportions of 977.0 and 23.0 per 1,000, which compare favourably with 959.3 and 40.7 per 1,000 in the previous year. Arm to arm re-vaccinations only numbered 30, of which 25 were successful, the proportion per 1,000, 833.3, being below that in 1884 by 32.6 per 1,000.



*United  
Kingdom.*

Primary vaccination with preserved lymph was performed in 1,235 cases with success in 1,037, or at the rate of 839·7 per 1,000, equal to an increase of 17·1; and re-vaccination with preserved lymph took place in 33 instances, 30 of them being successful, equal to a rate of 909·1 per 1,000 as compared with 605·6 per 1,000 in the previous year.

Taking both forms of primary vaccination, out of 2,672 cases, 2,441, or 913 per 1,000, were successful, and of both forms of re-vaccination out of 63 cases 55 were successful, or 873 per 1,000, both proportions comparing favourably with those in the previous year, while the total number of operations of vaccination in children amounted to 2,735 with perfect results in 2,496 cases, or 912·6 per 1,000, which is higher than the proportion in 1884 by 29·3 per 1,000.

*Small-pox.*—Among men there were 19 cases and 3 deaths in the United Kingdom. In India there were 12 cases, in the Colonies 2 cases, and among troops returning home from Egypt on board ship 1 case; none of these cases proved fatal. Among women there were 2 cases in the United Kingdom, 1 in India, and none in the Colonies; no death occurred. Among children there were 3 cases, 1 fatal, in the United Kingdom, and 6 cases, 1 fatal, in India; no case occurred in the Colonies.

The total numbers are, among men, 86 attacks and 7 deaths; among women 3 attacks and no deaths; and among children 9 attacks and 2 deaths. The ratios of attacks to strength are therefore, for men ·48 per 1,000, for women ·22 per 1,000, and for children ·36 per 1,000; and the rates of mortality to strength are for men ·04 per 1,000, for women *nil*, and for children ·08 per 1,000.

---

*On the Recruiting of the Army.**United Kingdom.*

The Annual Returns for 1885 show that 72,249 recruits were medically inspected during the year (as compared with 66,882 in the preceding year); of these 43,316 were passed as fit for service, and 28,933 were rejected as unfit, being in the ratios of 599·54 and 400·46 per 1,000 respectively.

Out of the total number of recruits inspected 57,898 were examined by Army Medical Officers only, of these 34,745 were found fit for service, being in the ratio of 600·11 per 1,000, and 23,153, or 399·89 per 1,000, were rejected as unfit.

The remainder of the total number inspected, 14,351, were primarily examined by Civil Medical Practitioners, and 2,848, or 198·45 per 1,000, were then rejected by them, the rest being referred to Army Medical Officers for secondary inspection, with the result that 2,654 more men, or 184·93 per 1,000, were rejected, leaving 8,849, or 616·62 per 1,000, as approved.

To the total number of rejections thus obtained must be added those of 278 recruits, equal to 3·84 per 1,000 of the total number inspected, who were found medically unfit for service within three months of their enlistment under Section XIX., paragraph 227 (d), Queen's Regulations and Orders for the Army, 1885.

As compared with the return for the previous year the total proportion of men passed fit for the service is greater by 16·52 per 1,000, the total proportion of rejections being consequently less by the same amount.

The following table shows the number inspected, the number rejected, and the ratios of rejections per 1,000 examined :—

TABLE I.

Examined by	Number of Recruits Inspected.	Number Rejected				Total found fit for service.
		On Inspection.	On Secondary Inspection by Army Medical Officers.	Unfit within three months of enlistment.	Total Rejected.	
Army Medical Officers -	57,898	23,153	—	} 278	28,933	43,316
Civil Medical Practitioners -	14,351	2,848	2,654			
Total -	72,249	26,001	2,654		28,933	43,316

Examined by	Ratio of Rejections per 1,000 inspected.				Ratio of those found fit per 1,000 inspected.
	On Inspection.	On Secondary Inspection by Army Medical Officers.	Unfit within three months of enlistment.	Total Rejected.	
Army Medical Officers -	399·89	—	} 3·84	400·46	599·54
Civil Medical Practitioners -	198·45	184·93			
Total -	359·88	184·93		400·46	599·54

Compared with the corresponding ratios for the preceding year a decrease of 15·38 per 1,000 has occurred in the proportion of rejections of recruits inspected by Army Medical Officers only, an increase of 21·41 per 1,000 in the proportion of rejections of recruits primarily inspected by Civil Medical Practitioners, a decrease of 40·72 in that of recruits secondarily inspected by medical officers, and a small fractional increase in the proportion of rejections of recruits within three months of enlistment.

The native countries of recruits, the ratios of rejections, and the proportion per 1,000 furnished by each country are given in the following table :—

United  
Kingdom.

TABLE II.

Native Countries of Recruits.	Examined by Army Medical Officers.		Primarily Examined by Civil Medical Prac- titioners.		Rejected on Secondary In- spection.	Unfit within three months of enlistment.	Total.		Ratio Rejected per 1,000 Inspected.	Proportion per 1,000 Recruits furnished by each Country.
	Inspected.	Rejected.	Inspected.	Rejected.			Primarily Inspected.	Rejected at Primary and Secondary In- spections and as unfit within three months of enlistment.		
England and Wales	43,124	17,596	11,563	2,505	2,142	231	54,687	22,474	410·96	757
Scotland - -	5,979	2,308	1,175	91	238	21	7,154	2,658	371·54	90
Ireland - -	8,187	3,087	1,524	246	262	26	9,711	3,571	367·73	134
British Colonies and Foreign Countries }	608	212	88	5	12	—	696	220	329·02	10
Not stated -	—	—	1	1	—	—	1	1	—	—
Total -	57,898	23,153	14,351	2,848	2,654	278	72,240	28,933	400·46	1,000

Compared with the results in the preceding year, a decrease in the ratio of rejections of recruits is observed in all the different countries, being 12·47 per 1,000 of those born in England and Wales, 68·23 of those born in Scotland, 4·42 of those born in Ireland, and 11·17 per 1,000 of those born in British Colonies or foreign countries. The proportion per 1,000 recruits furnished by England and Wales was 757, and differs only from the number in the previous year by an increase of 4; the proportion furnished by Scotland was 99, an increase of 2; the proportion of natives of Ireland 134, a decline of 5; and the proportion of those born in British Colonies or foreign countries 10, is below that in 1884 by 1 only.

The following table shows among 65,017 recruits, the number inspected for each arm of the service, the number rejected, the ratios of rejections, and the proportion for each arm of the service per 1,000 inspected. For the balance of the total inspected, 7,232 recruits, information of this nature is not available, as they are shown in the returns as inspected for general service, corps not stated:—

TABLE III.

Arms of the Service.	Examined by Army Medical Officers.		Primarily Examined by Civil Medical Prac- titioners.		Unfit within three months of enlistment.	Total.		Ratio of Rejections per 1,000 of Recruits Inspected for each Arm of the Service.	Proportion for each Arm of the Service per 1,000 inspected.
	Inspected.	Rejected.	Inspected.	Rejected at primary Inspection.		Inspected.	Rejected.		
Household Cavalry -	460	180	27	4	3	1	487	188	386·04
Cavalry of the Line -	4,058	1,620	1,047	200	216	20	5,105	2,056	402·74
Royal Artillery -	6,013	2,155	2,111	349	433	34	8,124	3,371	365·70
Royal Engineers -	1,379	444	295	40	40	11	1,644	535	325·42
Foat Guards -	1,628	516	660	82	99	22	2,288	719	314·25
Infantry Regiments -	35,713	14,334	16,015	2,142	1,831	178	45,728	18,485	404·24
Departmental Corps	1,505	546	136	29	26	12	1,611	613	375·55
Total - -	50,756	19,795	14,261	2,846	2,648	278	65,017	25,567	393·23
									1,000

Comparing these ratios of rejections of recruits for each arm of the service with those recorded in the preceding year it is observed that the ratio of rejections for the Household Cavalry is higher by 18·22, and that for the Cavalry by 11·50 per 1,000; but for the Royal Artillery a decrease of 25·04 per 1,000 has

occurred for the Royal Engineers one of 24·28, for the Foot Guards 72·18 *United Kingdom.* for the Infantry regiments 22·53, and for the Departmental Corps by 9·65 per 1,000. The proportion of recruits for each arm of the service per 1,000 inspected is greater than in the previous year by 26 for Infantry regiments, four for Royal Artillery, two for Royal Engineers, and one for Household Cavalry, while it has declined by 12 for the Departmental Corps; by 11 for the Cavalry of the Line, and by 10 for the Foot Guards.

In the next table are given the occupations of recruits previous to enlistment, the ratio rejected per 1,000 in each group of occupations, and the proportion of each group in every 1,000 recruits inspected :—

TABLE IV.

Occupations of Recruits.	Number Inspected.	Number Rejected.	Ratio Rejected per 1,000 Inspected.	Proportion of each Group in 1,000 recruits Inspected.
1. Labourers, Servants, Husbandmen, &c.	46,321	18,446	398·26	641
2. Manufacturing Artizans (as Clothworkers, Weavers, Lace Makers, &c.).	10,496	4,547	433·22	145
3. Mechanics employed in Occupations favorable to physical development (as Smiths, Carpenters, Masons, &c.).	9,664	4,002	414·11	134
4. Shopmen and Clerks -	3,868	1,580	408·69	54
5. Professional Occupations, Students, &c.	603	182	300·82	8
6. Boys under 17 years of age -	1,296	175	135·03	18
Not stated - - -	1	1	—	—
Total - - -	72,240	28,933	400·46	1,000

Compared with the returns for the preceding year this table shows the ratio of rejections of recruits is lower in Class 1, labourers, &c., by 27·98 per 1,000; in Class 2, manufacturing artizans, by 19·33; and in Class 6, boys under 17 years of age, by 3·08 per 1,000; while it is higher in Class 5, professional occupations, by 27·95; in Class 4, shopmen and clerks, by 22·55 per 1,000; and fractionally in Class 3, mechanics.

In 1,000 recruits inspected there were 641 of Class 1, labourers, or 8 more than the preceding year; in Class 2, artizans, 145, or an increase of 19; in Class 3, mechanics, 134, a decline of 11 from the number in the previous year; in Class 4, shopmen and clerks, 54, a decrease of 9; in Class 5, students, 8, a decrease of 2; and in Class 6, boys, 18, being lower by 5.

The state of education of 69,401 of the recruits inspected is given in the succeeding table, for the remainder, 2,848, of the total number inspected no information on this subject is forthcoming :—

TABLE V.

	Numbers Inspected.	Proportion per 1,000.
Well educated - - -	4,977	72
Able to read and write - - -	52,211	752
Able to read only - - -	5,996	86
Unable to read - - -	6,217	90
Total - - -	69,401	1,000

In comparison with similar information for the preceding year there is a decrease of 28 in the proportion of recruits per 1,000 who are classed as well educated, an increase of 36 in the proportion of those able to read and write, and one of 15 in the proportion of those able to read only, and a decrease of 23 in the proportion of those unable to read.

Table No. 6 shows the number of recruits rejected in 1885, with the causes of rejections arranged in classes, and the ratio per 1,000 in each class.

TABLE VI.

Causes of Rejections, in Classes.	Examined by Army Medical Officers.		Examined by Civil Medical Practitioners.				Unit within first three months of service.	Total examined.	
	57,898		14,351					72,249	
	Number Re- jected.	Ratio per 1,000 Re- jected.	Number Rejected by Civil Medical Practi- tioners at Primary Inspection.	Ratio per 1,000 Rejected.	Number Rejected by Army Medical Officers at Secondary Inspection.	Ratio per 1,000 Rejected.		Total Num- ber Re- jected.	Ratio per 1,000 Re- jected.
1. Syphilis - - -	538	9.29	116	8.08	52	3.62	—	706	9.77
2. Scrofula - - -	158	2.73	34	2.37	28	1.95	1	221	3.06
3. Phthisis - - -	183	3.16	29	2.02	12	.84	10	234	3.24
4. Impaired Constitution	338	5.84	15	1.04	43	3.00	1	397	5.50
5. Other General Diseases	208	3.59	73	5.09	32	5.23	5	318	4.40
6. Diseases of Nervous System.	41	.71	7	.49	17	1.18	24	89	1.23
7. Weakness of Intellect -	94	1.62	8	.56	27	1.88	30	159	2.20
8. Defective Vision - - -	2,488	42.97	270	18.81	246	17.14	9	3,013	41.70
9. Diseases of Eyes and Eyelids.	208	3.59	46	3.21	16	1.11	4	274	3.79
10. Diseases of Nose and Mouth.	29	.50	4	.28	4	.28	2	39	.54
11. Disease of Ears - - -	32	.55	—	—	8	.56	2	42	.58
12. Deafness - - -	66	1.14	6	.42	13	.91	4	89	1.23
13. Impediment of Speech	88	1.52	5	.35	9	.63	2	104	1.44
14. Disease of Heart - - -	923	15.94	195	13.59	92	6.41	27	1,237	17.12
15. Disease of Arteries (Aneurism).	147	2.54	1	.07	5	.35	—	153	2.12
16. Disease of Veins (Varix)	962	16.62	182	12.68	81	5.64	5	1,230	17.03
17. Disease of Lungs (ex- cept Phthisis).	70	1.21	30	2.09	6	.42	2	108	1.50
18. Loss or Decay of many Teeth.	475	8.20	92	6.41	72	5.02	2	641	8.87
19. Hernia - - -	385	6.65	105	7.32	36	2.51	12	538	7.45
20. Laxity of Abdominal Rings	128	2.21	7	.49	7	.40	2	144	1.99
21. Hemorrhoids - - -	99	1.71	27	1.88	13	.91	—	139	1.92
22. Diseases of the Urinary Organs.	40	.69	49	3.41	3	.21	1	93	1.29
23. Varicocele - - -	907	15.67	225	15.68	85	5.92	5	1,222	16.91
24. Other Diseases of the Genital Organs (not Syphilitic).	123	2.12	28	1.95	14	.97	—	165	2.28
25. Defects of Upper Ex- tremities, from Frac- ture, Contraction, Luxation, &c.	338	5.84	37	2.58	59	4.11	9	443	6.13
26. Defects of Lower Ex- tremities, from Frac- ture, Contraction, Luxation, &c.	708	12.23	158	11.01	96	6.69	12	974	13.48
27. Flat Feet - - -	515	8.89	94	6.55	62	4.32	4	675	9.34
28. Diseases of Joints - - -	167	2.88	17	1.18	20	1.39	3	207	2.87
29. Other Affections of Bones and Muscles.	125	2.16	16	1.11	23	1.60	1	165	2.28
30. Ulcers, Wounds, and Cicatrices.	199	3.44	16	1.11	32	2.23	2	249	3.45
31. Other Affections of the Cutaneous System.	229	3.96	59	4.11	18	1.25	1	307	4.25
32. Malformation of Ears -	13	.22	—	—	1	.07	—	14	.19
33. Malformation of Nose and Mouth.	7	.12	1	.07	3	.21	—	11	.15
34. Malformation of Chest and Spine.	386	6.67	128	8.92	47	3.28	3	564	7.81
35. Malformation of Urin- ary or Genital Organs.	20	.35	—	—	2	.14	—	22	.31
36. Marks of Punishment, or of letter D. or B.C.	5	.09	—	—	—	—	—	5	.07
37. Under Height - - -	1,710	29.53	54	3.76	221	15.40	15	2,000	27.68
38. Under Chest Measure- ment.	6,378	110.16	231	16.10	623	43.41	35	7,267	100.58
39. Under Weight (Mus- cular Tenuity and Debility).	2,781	48.03	445	31.01	385	26.83	14	3,625	50.17
40. Apparent Age not in accordance with Gene- ral Order.	613	10.50	29	2.02	124	8.64	2	768	10.63
41. Not likely to become efficient.	210	3.63	9	.63	14	.97	27	260	3.60
42. Over height - - -	19	.33	—	—	3	.21	—	22	.31
Total Rejected - - -	23,153	399.89	2,848	198.45	2,654	184.93	278	28,033	400.46

In very few instances do the proportions of rejections for the various causes differ more than slightly from those given in the corresponding returns for the preceding year. Those worthy of mention are only "impaired constitution," in which a decrease of 5.54 per 1,000 is observed; "defective vision," which shows an increase in rate of rejection of 3.87; "under height," with a decrease of 6.55; "under weight," one of 10.28 per 1,000, and "not likely to become efficient" an increase of 3.48 per 1,000.

*United Kingdom.*

With regard to difference in the ratios of rejections of recruits for various causes when primarily examined by Army Medical Officers or Civil Medical Practitioners, it is noticed that the ratio of rejection by Medical Officers for defective chest measurement was 110.16 per 1,000, and that by Civil Practitioners 16.10 per 1,000; in the case of under height Medical Officers rejected 29.53 per 1,000, and Civil Practitioners 3.76; in the case of defective vision the ratio of rejections by Medical Officers was 42.97 per 1,000, and that by Civilian Practitioners 18.81 per 1,000; in the instances of "under weight," and "apparent age not being in accordance with General Order," certain marked differences are noticed, and in a minor degree in some other causes of rejection.

*Ages, Heights, Weights, and Chest Measurements of Recruits Inspected.*

In the subjoined table are shown the ages of all recruits as given at their primary inspection, and the proportion of each age per 10,000:—

TABLE VII.

Ages.	Numbers Inspected.	Proportion per 10,000.
Boys under 17 years - - - -	1,406	195
From 17 to 18 " - - - -	1,306	181
" 18 to 19 " - - - -	24,630	3,409
" 19 to 20 " - - - -	17,449	2,415
" 20 to 21 " - - - -	7,745	1,072
" 21 to 22 " - - - -	5,775	799
" 22 to 23 " - - - -	4,603	637
" 23 to 24 " - - - -	3,624	502
" 24 to 25 " - - - -	4,107	568
25 years and upwards - - - -	1,603	222
Not stated - - - -	1	—
Total - - - -	72,249	10,000

As compared with the return for the preceding year, the proportion of recruits inspected under 17 years of age has decreased by 42 per 10,000, that between 17 and 18 years of age by 76, between 19 and 20 years by 218, and between 23 and 24 years of age by 23; but the proportion has increased between 18 and 19

United  
Kingdom.

years of age by 222, that between 20 and 21 years by 25, between 21 and 22 years by 28, between 22 and 23 years by 1, between 24 and 25 years by 43, and over 25 years by 40 per 10,000.

The next table shows the heights of recruits at their inspection, and the proportion of each height per 10,000 inspected. It also gives the heights of recruits at their inspection, arranged in series according to age, together with the proportion per 10,000 of each height at each age :—

TABLE VIII.

Heights of Recruits on Inspection.			Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Totals at each Height.
ft. in.	ft.	in.											
Under 5	3	-	1,182	58	477	204	40	44	20	17	11	7	2,040
5	3 to 5	4	113	359	4,208	1,951	556	339	234	190	180	58	8,247
5	4 to 5	5	62	363	6,044	3,962	1,640	1,165	799	584	614	219	15,452
5	5 to 5	6	44	261	5,441	3,605	1,631	1,114	978	697	773	306	14,910
5	6 to 5	7	12	142	3,711	2,923	1,373	1,083	950	769	782	320	12,065
5	7 to 5	8	4	60	2,328	2,120	1,015	842	680	536	665	291	8,521
5	8 to 5	9	5	38	1,273	1,367	691	573	444	402	512	209	5,514
5	9 to 5	10	1	17	649	760	419	340	265	223	306	92	3,078
5	10 to 5	11	1	3	235	261	203	155	129	126	152	64	1,329
5	11 to 6	0	2	2	130	150	106	54	61	40	65	25	635
6	0 and upwards		—	4	74	86	71	60	63	40	47	12	457
Totals at each age			1,406	1,306	24,630	17,449	7,745	5,775	4,603	3,624	4,107	1,603	72,218

Heights of Recruits on Inspection.			Proportions per 10,000 at each Age.										Total Proportion of each Height per 10,000 inspected.
ft. in.	ft.	in.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 5	3	-	8,265	444	104	116	52	76	43	47	27	44	282
5	3 to 5	4	804	2,741	1,738	1,118	718	587	508	524	498	362	1,142
5	4 to 5	5	441	2,780	2,454	2,271	2,117	2,017	1,736	1,612	1,405	1,366	2,139
5	5 to 5	6	313	1,999	2,209	2,101	2,106	1,929	2,125	1,924	1,882	1,909	2,064
5	6 to 5	7	85	1,087	1,507	1,675	1,773	1,875	2,064	2,122	1,904	1,596	1,670
5	7 to 5	8	23	459	945	1,215	1,310	1,458	1,434	1,479	1,619	1,815	1,179
5	8 to 5	9	36	291	517	783	892	992	965	1,109	1,247	1,304	763
5	9 to 5	10	7	130	263	436	541	599	576	615	745	574	426
5	10 to 5	11	7	23	95	150	262	269	280	348	370	399	184
5	11 to 6	0	14	15	53	86	137	94	132	110	158	156	88
6	0 and upwards		—	31	30	49	92	104	137	110	115	75	63
Total			10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

United Kingdom.

Compared with the results for the previous year a decrease is observed in the proportion of recruits per 10,000 inspected of 88 under 5 feet 3 inches in height, of 13 between 5 feet 3 inches and 5 feet 4 inches, of 97 between 5 feet 7 inches and 5 feet 8 inches, of 16 between 5 feet 10 inches and 5 feet 11 inches, and of 10 between 5 feet 11 inches and 6 feet in height; but an increase of 122 is noticed in the proportion of recruits between 5 feet 4 inches, and 5 feet 5 inches in height, one of 73 in the proportion between 5 feet 5 inches and 5 feet 6 inches, of 23 between 5 feet 6 inches and 5 feet 7 inches, of 5 between 5 feet 9 inches and 5 feet 10 inches, and of 1 of 6 feet and upwards; no change has occurred in the proportion between 5 feet 8 inches and 5 feet 9 inches in height.

Omitting boys, the highest proportion of recruits of any height at any age per 10,000 inspected was 2,780 between 17 and 18 years of age, and from 5 feet 4 inches to 5 feet 5 inches in height; this proportion, however, depends on comparatively small numbers. The highest proportion depending on a considerable number of inspections was 2,454 between 18 and 19 years of age, and from 5 feet 4 inches to 5 feet 5 inches in height. In the previous year also, the highest proportion, based on a large number of inspections, was 2,340 at the same age and height.

In the succeeding table are given the weights of 69,326 recruits at their inspection, and the proportion of each weight per 10,000 inspected; for the balance, 2,923 of the total number inspected information has not been furnished; these being cases primarily rejected by civil practitioners together with a few from stations where weighing machines are not supplied. The table also shows the weights of these recruits at their inspection, arranged in series according to age, together with the proportion per 10,000 of each weight at each age:—

TABLE IX.

Weights of Recruits on Inspection.	Boys under 17 years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Totals at each Weight.
Under 100 lbs.	1,122	28	71	19	3	4	—	1	1	1	1,250
100—110 lbs.	168	213	1,449	426	100	61	52	29	19	18	2,535
110—120 "	69	663	8,611	3,761	1,374	847	461	339	274	115	16,606
120—130 "	13	342	8,686	6,614	2,385	1,640	1,269	901	893	329	23,072
130—140 "	25	107	3,439	3,357	1,930	1,540	1,321	968	1,166	431	14,904
140—150 "	—	33	931	1,422	1,073	858	766	736	866	351	7,036
150—160 "	1	10	247	397	400	400	336	303	460	174	2,728
160—170 "	—	1	45	94	145	115	131	118	164	83	896
Upwards of 170 lbs.	—	—	17	20	31	40	46	40	64	41	299
Totals at each age	1,398	1,299	23,696	16,710	7,441	5,505	4,372	3,455	3,907	1,543	69,326



*United  
Kingdom.*

Weights of Recruits on Inspection.	Proportions per 10,000 at each Age.										Total Proportion of each Weight per 10,000 inspected.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 100 lbs. -	8,026	215	30	11	4	7	—	3	2	6	180
100—110 lbs. -	1,202	1,610	612	255	134	111	119	84	49	117	366
110—120 „ -	493	4,349	3,718	2,251	1,847	1,539	1,032	981	701	745	2,395
120—130 „ -	93	2,633	3,666	3,958	3,205	2,979	2,903	2,608	2,286	2,132	3,328
130—140 „ -	179	824	1,451	2,308	2,594	2,797	3,021	2,860	2,984	2,793	2,150
140—150 „ -	—	254	393	861	1,442	1,558	1,752	2,130	2,217	2,275	1,015
150—160 „ -	7	77	104	238	537	727	768	877	1,177	1,128	394
160—170 „ -	—	8	19	56	195	209	300	341	420	538	129
Upwards of 170 lbs. -	—	—	7	12	42	73	105	116	164	206	43
Totals at each age	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

In comparison with the return for the previous year a decrease of 33 has occurred in the proportion per 10,000 inspected of recruits under 100 lbs. weight, one of 99 in that of recruits between 130 lbs. and 140 lbs., of 57 in that between 140 lbs. and 150 lbs., of 25 between 150 lbs. and 160 lbs., and of 15 between 160 lbs. and 170 lbs. in weight; but an increase of 12 has occurred in the proportion of recruits between 100 lbs. and 110 lbs. weight, one of 214 in that of recruits between 110 lbs. and 120 lbs., of 1 between 120 lbs. and 130 lbs., and of 2 in the proportion of recruits weighing 170 lbs. or upwards.

Omitting boys, the highest proportion of recruits of any weight at any age per 10,000 inspected was 4,349 between 17 and 18 years of age, and between 110 and 120 lbs. in weight, but this proportion is based on comparatively small numbers. The highest proportion depending on a large number of inspections is 3,958 between 19 and 20 years of age and between 120 and 130 lbs. weight. In the preceding year the highest proportion was 3,825 between 18 and 19 years of age and between 120 and 130 lbs. in weight.

The next table gives the chest measurements of recruits taken at their inspection, and the proportion of each measurement per 10,000 inspected. It also shows the chest measurements of recruits taken at their inspection arranged in series according to age, together with the proportion per 10,000 of each chest measurement at each age.

TABLE X.

Chest Measurement of Recruits on Inspection.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Total at each Chest Measurement.
Under 31 inches -	1,175	72	315	106	11	11	8	2	9	3	1,712
31—32 inches -	121	197	1,867	799	228	124	6	25	27	17	3,472
32—33 „ -	65	405	6,279	3,149	967	533	392	293	222	70	12,375
33—34 „ -	37	423	8,987	5,842	2,279	1,559	1,043	796	695	255	21,916
34—35 „ -	8	145	5,151	4,745	2,362	1,913	1,632	1,197	1,311	514	18,978
Above 35 inches -	—	64	2,031	2,808	1,898	1,635	1,461	1,311	1,843	744	13,795
Totals at each age	1,400	1,306	24,630	17,449	7,745	5,775	4,693	3,624	4,107	1,603	72,248

*United Kingdom.*

Chest Measurement of Recruits on Inspection.	Proportions per 10,000 at each Age.										Total proportion of each Chest Measurement per 10,000 inspected.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 31 inches -	8,357	551	123	61	14	19	17	6	23	19	237
31—32 inches -	361	1,509	758	458	294	215	145	69	66	106	481
32—33 „ -	463	3,101	2,549	1,805	1,248	923	852	808	541	437	1,713
33—34 „ -	263	3,239	3,649	3,348	2,943	2,680	2,266	2,196	1,692	1,501	3,033
34—35 „ -	57	1,110	2,091	2,719	3,050	3,313	3,546	3,303	3,199	3,206	2,627
Above 35 inches -	—	480	825	1,009	2,451	2,831	3,174	3,618	4,487	4,641	1,909
Total -	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

Compared with the corresponding return for the previous year it is observed that the proportion per 10,000 inspected of recruits under 31 inches chest measurement has decreased by 12, that of recruits between 34 inches and 35 inches by 200, and of recruits over 35 inches chest measurement by 102, while the proportion of recruits between 31 and 32 inches chest measurement has increased by 16, of those between 32 and 33 inches by 239, and of those between 33 and 34 inches by 59 per 10,000.

Omitting boys, the highest proportion of recruits of any chest measurement at any age per 10,000 inspected was 4,641 at the age of 25 and upwards, and above 35 inches chest measurement, followed by 4,487 between 24 and 25 years of age, and above 35 inches chest measurement. In the previous year the highest proportions were within the same limits of age and chest measurement. Taking the ages at which the greatest number of recruits are inspected, the highest proportion is 3,649 per 10,000 between 18 and 19 years of age, and between 33 and 34 inches chest measurement. This was also the case in the preceding year.

From the foregoing tables it has been calculated that, excluding boys under 17 years of age, the average age of recruits at inspection during the year was 19·71 years (above that of the preceding year by ·03); the average height was 5 feet 4·63 inches, the average weight 123·04 lbs., and the average chest measurement 33·37 inches.

*United  
Kingdom.*

*On the Influence of Age on the Mortality of the Troops serving in the United Kingdom.*

The rates of mortality at different ages (arranged in quinquennial periods), in the several arms of the service, are shown in the following table :—

Arms of the Service.	Annual Ratio of Deaths per 1,000 Living at the following Ages:—					
	Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and up- wards.
Household Cavalry - - -	—	—	—	—	19·41	30·30
Cavalry - - -	3·16	4·02	5·76	6·58	9·57	32·60
Royal Artillery - - -	2·83	2·15	6·31	14·13	18·77	16·81
Royal Engineers - - -	4·28	5·97	6·09	18·82	9·00	19·04
Foot Guards - - -	6·28	7·88	7·97	3·86	9·17	16·13
Infantry - - -	3·46	5·38	8·41	9·82	18·08	31·91
Regimental Depôts - - -	3·96	4·53	8·58	9·01	18·22	32·48
Garrison, Staff, and Departmental Corps.	2·43	6·58	12·69	11·95	27·36	84·74
Average of all Troops at Home	3·54	4·80	7·54	10·72	15·56	27·34
Ditto ditto 1875-84	2·06	4·76	6·27	7·90	15·40	22·79

\* The relative mortality of the civil population at different ages, as contrasted with the military in previous years, is omitted from this table, as the figures in the case of the former have not been brought down to date, and therefore do not furnish the means of fair comparison.

## HOME STATIONS.

*United Kingdom.*

## SANITARY CONDITIONS.

*Northern District.*

The Principal Medical Officer, Deputy Surgeon-General R. A. Chapple, reports that the general health of the troops during the year was good, and the daily sick from all causes was less than 4 per cent. of strength; also, that the statistics of sickness and mortality show that there was considerable improvement in the health of the troops in this district during the year as compared with that during the previous six years.

The sanitary condition of the barracks and quarters at the various stations is reported as generally satisfactory.

With regard to barracks it is reported that "the cubic space for the men has been sufficient throughout the district, except occasionally at certain stations during the militia trainings, or on the sudden influx of large numbers of recruits, but no ill effects have been reported.

"Ventilation has been pretty good on the whole; minor defects have arisen from time to time, but have been remedied as occasion required.

"The drainage has been generally good throughout, and latrines and urinals kept in satisfactory order.

"The accommodation in hospitals has been generally good and sufficient throughout the district, but old hospitals, such as Sunderland and Berwick, have been complained of in previous years, and new hospitals have been applied for in the annual estimates from time to time, but have not been sanctioned. Additional accommodation is much required at York Hospital for the Medical Staff Corps, both married and single, as several of the non-commissioned officers and men have to be accommodated in barracks and in lodgings at some distance from their duties."

The quality and quantity of the rations, the means of cooking, the water supply and ablution arrangements, together with the sanitary condition generally of the vicinity of barracks and hospitals, are all favourably noticed by the Principal Medical Officer.

*Eastern District.*

It is reported by the Principal Medical Officer, Deputy Surgeon-General H. H. Reade, V.C., that the general health of the troops in the district was on the whole satisfactory during the year, and there was no unusual sickness. Catarrhal and rheumatic affections caused a large number of admissions; they are not attributable, however, to any local conditions, but to the bleak, raw climate which prevails on the east coast, and to the prolonged easterly winds during the early part of the year.

The reports of medical officers on the health of the troops, and sanitary condition of the barracks, quarters, hospitals, &c., have been, as a rule, very favorable. At Colchester a hospital for infectious cases is much required, and a plan for increased accommodation of this nature, apart from the other wards, is under consideration. A separate ward for the treatment of lunatics is also needed. At Ipswich increased hospital accommodation is to be desired, and measures for its provision have been considered, though no progress towards carrying them out has been made.

At Bury St. Edmunds and at Lincoln it was represented that the serge clothing issued to recruits on joining afforded insufficient protection during the

*United  
Kingdom.*

winter months, and a recommendation having been made to that effect, the ordinary red clothing was taken into wear with beneficial results.

Among the more important sanitary improvements effected during the year were : At Bury St. Edmunds, the provision of double sashes to the windows of the Station Hospital ; at Colchester, waste pipes disconnected from tanks in cook-houses and ablution rooms in the artillery barracks, and sinks disconnected from drains in the cavalry barracks ; at Ipswich, the provision of bath and ablution rooms, and of ventilating grates at the station hospital ; and at Norwich, the erection of foul air shafts to cells and prisoners' room, as well as the provision of an ablution room.

#### *Western District.*

The Principal Medical Officer, Deputy Surgeon-General J. Tulloch, reports that the amount of barrack accommodation was generally sufficient during the past year, and the means of ventilation, warming, and lighting were satisfactory. The accommodation for married families, however, was insufficient at Pembroke Dock, Worcester, and Taunton. Some open seams in the wooden huts at Pembroke Dock required to be closed by filleting ; this service was estimated for, and it was expected would be carried out shortly.

With regard to drainage it is remarked that no grave defect occurred, and all small ones were remedied as brought to notice. A new system of drainage was completed at Newport, and is said to be all that could be desired. The sanitary condition of latrines and urinals has been much improved throughout the district.

No complaint of the water supply occurred, with one exception, in which case the defect was rectified. Large boilers to supply hot water for the ablution of recruits on joining, and for general purposes, have been established at Bodmin, Exeter, Taunton, Horfield, Cardiff, and Brecon.

The rations are reported to have been generally good, the cooking, on the whole, satisfactorily done, and the diets very fairly varied.

Among other sanitary improvements may be mentioned the raising of the roof of the guard-room, and the ventilation of the coffee bar at Horfield.

The gymnasium at Devonport and Pembroke Dock were in full operation during the year, and were attended with beneficial results.

#### *Southern District.*

Surgeon-General Sir Anthony Home, V.C., K.C.B., Principal Medical Officer, remarks that " various notices are contained in the sanitary reports of medical officers respecting matters in which they either state or imply sanitary defects, " but in no instance is the defect or shortcoming quite distinctly alleged to have " contributed to the prevalence of sickness, with anything in the shape of " proof ; usually the notices imply that abstract sanitary principle would be " better met by such and such an arrangement, and to this extent I agree with " every notice made ; for the most part, too, in each instance the principle is " already recognised as good and desirable by the military authorities.

" Crowding of the men in their barrack rooms is reported to have taken " place at Tipnor, remedied since by a hut of the Aldershot pattern, and temporarily by the use of tents. Crowding at Dorchester has been permanently " relieved by the erection of huts of the same kind. In other instances, " crowding has been temporary and generally unexpected, arising from emergency such as at Fort Brockhurst, which is at times insufficient for the " accommodation, with the proper amount of cubic space, of the time-expired " men returning from abroad. At Marchwood the crowding was obviated in " summer by the use of tents, but in winter this course is not available, and the " magazine being an important one, the guard cannot be reduced in numbers.

" The rations of the soldiers in the district have not been altered in quantity " during the year ; the quality varies in the different sub-districts, no general " statement respecting the quality is applicable, it must be considered, not

“ absolutely, but in connexion with the fact that the same person does not *United*  
 “ report concerning every station; what is good or the reverse is therefore *Kingdom*.  
 “ variously estimated.

“ Important structural additions have been made in barracks by the occupa-  
 “ tion of (part of) the new Clarence Barracks at Portsmouth, and of new lines  
 “ at Tipnor and at Dorchester. Additional ablutions rooms have been built  
 “ for the use of the men in the Cambridge Barracks at Portsmouth, very con-  
 “ veniently placed and well arranged. Crowding in prisoners' rooms is very  
 “ common, and this condition is hardly avoidable, as no average occupation  
 “ can be reckoned on.

“ During the year many alterations and additions for the sake of improve-  
 “ ment have been made in the superficial drainage of places in the district,  
 “ those at new barracks, Gosport, being the most extensive; at Fort Gomer the  
 “ surface drainage has been in part directed from the moat, and will hereafter  
 “ be so in full. Improved ventilation has been given to prisoners' rooms and  
 “ to latrines at many places. Many improvements have been made in kitchens  
 “ for the sake of greater convenience. The water supply is generally plentiful,  
 “ an exception to this is that at Golden Hill, where water was brought by carts  
 “ from a distance to supplement the supply from the well at the fort.

“ *Hospitals*.—A station hospital has been established at Sandown, a non-  
 “ dieted one at Hurst Castle, a hut hospital for 20 beds has been built at Dor-  
 “ chester, additional to the existing hospital. Numerous alterations have  
 “ been made in the Portsmouth station hospital, and the repairs of one kind  
 “ and another may be said to have been incessant.”

---

#### *Netley.*

Surgeon-General W. S. Murray, M.B., Principal Medical Officer, reports that the sanitary arrangements of the Royal Victoria Hospital were carefully attended to during the year. The accommodation was sufficient, and there was no overcrowding at any time.

The following improvements were carried out in the course of the year:—The hot-water apparatus was extended to the patients' recreation room with much benefit to the invalids frequenting the room. The process of relaying with asphalt the floors of the lavatories in the divisions was carried on as money became available for the service. A sloping approach was made back and front to the north wing, contiguous to the lift, to facilitate the removal of lying down patients and those unable to walk from the ambulance to the lift. A six-inch pipe, in place of one of four inches, was laid to convey water from the hospital to the reservoir. A “destructor” or “cinerator” was erected near the laundry for the destruction, by heat, of the refuse from the hospital. It is built on the plan of that in use in the arsenal at Woolwich, and is estimated, when in working order, to consume refuse to the extent of three cart-loads daily. The Giles's gas stove, sent on loan for use in the kitchen, for purposes of instruction in the cookery classes, has been purchased for permanent use.

The lunatic hospital is reported to have been generally well kept and in good order, and its sanitary condition well attended to.

---

*United Kingdom.**Chatham District.*

The acting Principal Medical Officer, Brigade Surgeon F. Wade, reports "that the general health of the troops has been fairly good, and there has been no unusual amount of sickness during the year, the daily number of sick under treatment being slightly under 5 per cent."

The sanitary condition of the several barracks and quarters in the district is favorably reported on. The accommodation in barracks was ample and in hospitals also, except at Gravesend. In this case overcrowding was avoided by transferring men to other hospitals. It is reported that the new hospital at Gravesend will be ready for occupation in a short time. The drainage at the different stations is said to be generally good. At Sheerness, owing to the low level of the barracks, the outlets of the main drains opening into the sea have to be closed with each returning tide. This is unavoidable, but a strain is in consequence put on the traps of surface drains to prevent the escape of sewer gas. In some instances these traps were found defective and were renewed. Proper ventilation of the main drains has been estimated for, and when this is carried out the pressure will be relieved.

The rations are reported to have been of good quality, and the supply of water good and sufficient. The ablution rooms, &c. have been well attended to.

In Chatham, among various sanitary services carried out during the year were improvements in ventilation of men's rooms in Brompton Barracks, and of non-commissioned officers' quarters in Chatham and St. Mary's Barracks; also ventilation and trapping of drains. At Sheerness, in addition to the ventilation of sewers and improvements in the construction of certain quarters, the provision of increased bath accommodation in barracks was carried out.

*South-Eastern District.*

The reports of medical officers show that the sanitary conditions obtaining at the different stations are generally good as regards accommodation in barracks and hospitals, drainage, conservancy, water supply, ablution and latrine arrangements. The rations for the troops and the means and variety of cooking are generally favorably reported on.

Some defects are pointed out; among others, the old and dilapidated condition of the wooden huts at Shorncliffe, which are now unsuitable for the permanent occupation of troops. They are, however, being gradually replaced by permanent huts built either of brick or of concrete. Four of these were completed during the year and taken into use. At Chichester eight additional huts, accommodating 209 non-commissioned officers and men, have been built, and improvements made in the means of ventilation and warming. At Canterbury seven new huts have been built which will hold 266 non-commissioned officers and men; a new hut for stores has also been provided.

At Dover improvements to drainage have taken place in the South Front Barracks.

Brigade Surgeon W. Tanner, Acting Principal Medical Officer, states that he agrees in opinion with the medical officer in charge of the Western Heights Station Hospital, who thinks the place unfit as a quarter for troops on their return from tropical or other trying service. "The barracks are much exposed in situation, their position on the top of high hills makes access to them hard work for men suffering from malarious affections, anæmia, and nervous exhaustion; and the night duty on such exposed posts as those of many of the sentries is a cause of disease of the respiratory passages, lungs, and throat."

At Brighton the medical officer in charge calls attention to the necessity for a new hospital on account of the confined space of the present one, its want of accommodation, and its proximity to the veterinary infirmary.

*Home District.*

Deputy Surgeon General Sir James Hanbury, K.C.B., Principal Medical Officer, states in his report that "all sanitary defects observed were at once brought to the notice of the military authorities, and, when practicable, immediate steps were taken for rectifying them. *United Kingdom.*

"The barracks, speaking generally, afforded sufficient accommodation, and their sanitary condition was well maintained. Occasionally there was some overcrowding at Caterham, Hounslow, and Kingston-on-Thames, when the influx of recruits was unusually large; but this was temporary, and had no prejudicial effect. In consequence of the severe weather which prevailed, a special report was made on the low temperature of the barracks, ablution rooms, &c., in London, Windsor, and Caterham."

The Principal Medical Officer is of opinion that the underclothing of the soldier is inadequate for the winter season, and he recommends an increase.

It is recorded that the ventilation at the Tower was found, in the winter, to be insufficient and defective, and this condition was considered to be the origin of some cases of illness which occurred at that time. The defects that existed were therefore remedied, with beneficial results.

Among defects which are mentioned as requiring or undergoing remedy are the following. The surface drainage of the barrack squares at Chelsea, Kingston-on-Thames, Hounslow, and Caterham need extension and improvement. The prisoners' room in the infantry guard-house, Hounslow, is not sufficiently large for the requirements, and the same is said regarding the guard-room at Kensington Barracks. At Reading defects existed in the main sewer and in the surface drainage which are being remedied.

At Hounslow temporary huts have been erected in the infantry square for the accommodation of 400 men, also a hospital hut close to the present hospital.

With regard to the hospital at Rochester Row for the Brigade of Guards, the Principal Medical Officer points out that the accommodation is insufficient, and in consequence, that a considerable number of sick are transferred to the Herbert Hospital, Woolwich, for treatment; that as the hospital consists of three detached blocks, a separate staff and establishment is maintained for each, thus rendering its administration difficult and expensive. He also remarks that though some important improvements have been made during the year these buildings can never be made entirely suitable for a military hospital.

---

*Woolwich District.*

The Principal Medical Officer, Deputy Surgeon-General E. G. McDowell, C.B., reports that "there has been considerable improvement in conservancy arrangements during the year, viz.: those in the Royal Artillery Barracks, Nos. 1, 2, 124, and Riding Establishment; Grand Dépôt Barracks, No. 1; Commissariat and Transport Barracks (main latrine) and Provost Prison, have all been converted from the old pit to the flush-out system. Other sanitary defects have been trifling, and have been remedied on representation."

"The meat ration to the garrison has been generally good, and there has been considerable improvement in the bread ration. The cooking has been fairly good, and the dinners sufficiently varied. Some of the kitchens of the Royal Horse Artillery are rather distant from the barracks. The water supply has been ample and good."

"The clothing has been sufficient and suitable; extra blankets were issued in the cold weather."

"It is much to be desired that facilities for supplying hot water to bath rooms during the winter months should be provided. The ablution accommodation is sufficient."

"There has been no overcrowding in barracks, and the means of ventilation are fairly good."



*United  
Kingdom.*

"There is not sufficient accommodation for the married families of the garrison, and occasionally there has been overcrowding, but the quarters are clean, healthy, and comfortable, with the exception of some of the staff-sergeant's quarters in the Royal Artillery barracks, which are gloomy, dark, and shut in by other buildings; also the basement quarters of the Cambridge Barracks, which are draughty and difficult to warm."

With regard to the Herbert Hospital, the Principal Medical Officer states that on the 15th October its management was changed from that of a station to that of a general hospital, and by the end of the year this system was in full operation. He remarks also as follows:—"It is, perhaps, too soon to offer an opinion on the advantages or otherwise of the new system, but the following points are brought into prominent notice in its favour.

"The cases that require most careful nursing are concentrated, and the labour of those who have to deal with them is, therefore, economised.

"The responsibility of the several medical officers is more clearly defined, and they are brought into practical contact with the working of a hospital, such as would be established on active service, and so are trained to deal with the same."

The accommodation in the hospital is stated to be ample, but the Principal Medical Officer urges the necessity of a special building for infectious diseases. The supplies to the hospital have been good, the cooking all that could be desired, and the water supply satisfactory in every way.

#### *Aldershot Division.*

Surgeon-General Hendley, C.B., the Principal Medical Officer, states that the health of the troops continued good, and though the admission ratio had somewhat increased, it was due to no particular class or order of diseases.

He reports that the drainage of the permanent barracks and hospitals was satisfactory, but that in the South Camp was found to be very defective (to which was attributed the occurrence of certain cases of diphtheria), the whole of the soil pipes connecting the latrines with the main drains were therefore taken up and relaid, which was attended with excellent results. The Goux system of conservancy was carried out in the North Camp, and was reported upon favourably.

"No overcrowding occurred in barracks and huts, and their ventilation is satisfactory.

"The ablution accommodation is fair, but the water supply is insufficient; in the South Camp it was cut off for some time during the summer, and water for ablution purposes was obtainable only from wells, and had to be carried in some cases a considerable distance.

"For some four months during the summer, owing to scarcity of water at Bourley Bottom, all the barracks and the 2nd Station Hospital were supplied from the Aldershot town waterworks; this water is of excellent quality and abundant, and it is suggested that it should be used permanently; the supply from Bourley reservoir would then be ample for the requirements of the troops in the South Camp.

"The cooking arrangements generally have been favorably reported on; the quality and quantity of the rations have been good, and the canteen supplies satisfactory."

Among the sanitary improvements enumerated may be mentioned the following, in addition to those connected with the drainage of the South Camp above alluded to.

The drainage in the Royal Horse Artillery and the Royal Artillery barracks has been generally improved; five new ventilating shafts have been erected, surface gutters have been renewed, and open channels from waste pipes in the ablution rooms have been made.

The system of ventilation has been improved in the married quarters, cavalry barracks.

Water supply has been laid on to urinals in the cavalry barracks, and several other minor improvements were carried out during the year.

*North British District.*

In the report of the acting Principal Medical Officer, it is shown that "the health of the troops and sanitary condition of most of the stations in the district have been fairly satisfactory, and the loss to the service from death, invaliding, and constantly sick in hospital does not appear to have been influenced to any appreciable extent by insanitary conditions." The death rate was higher than in the preceding year, but this was due to the unusual number of sudden or suicidal deaths which occurred. *United Kingdom.*

The following points regarding the sanitary condition of the different stations are noted. The sanitary state of Edinburgh Castle was as satisfactory as the primitive construction of the barracks would admit of. The sewer ventilation is said to be defective, and the condition has been reported. Ablution accommodation in the new barracks was insufficient, but provision has been made for more baths. The reading and recreation room was enlarged and improved during the year, and a scheme for the general improvement of the barracks has been under consideration. The sanitary condition of the vicinity of the barracks at Piershill is not considered altogether satisfactory, and the proximity of the sewage farm is alluded to, but no ill-effects have been traced to it. At Leith Fort the barracks are said to be old, some of the rooms small, and their ventilation imperfect, otherwise the sanitary conditions were most satisfactory. At Glencorse the barracks are of recent construction, and the sanitary conditions were generally satisfactory.

Concerning Maryhill Barracks, Glasgow, it is reported that "the immediate vicinity is still in an unsatisfactory sanitary condition, but it is expected that the two chief nuisances will be removed shortly, viz., the Quarry hole, near the hospital gate, which is being filled in, and the open sewer known as the "Posail Burn." At Stirling it was thought that the latrines were not sufficiently ventilated, but with this exception the sanitary conditions were very satisfactory.

At Perth and Hamilton some improvements in drainage are desirable. and in the latter place the barrack accommodation was not considered to be sufficient. At Fort George, during the militia training, there was some amount of overcrowding. The lighting in the barracks in the long winter nights is said to be insufficient, and the provision of reflecting wall lamps was recommended. At Ayr and Blackness sanitation is reported as satisfactory.

Among other improvements a supply of hot water for soldiers' baths has been provided at Glencorse, Perth, Stirling, Leith, Hamilton, and Aberdeen.

---

*Channel Islands.*

The Senior Medical Officer, Brigade Surgeon F. Ferguson, M.D., reports that "the health of the troops has been good during the past year. The sanitation of Guernsey and Alderney appears to have been satisfactory, no special cause of disease being recorded.

"In Jersey the sanitary condition of barracks, married quarters, hospitals, &c., has been reported satisfactory. Fault was, however, found with the drainage at St. Peter's, and immediate steps were taken to alter the whole system.

"The Medical Officer at Alderney reports the latrines at Chateau L'Etoi, Fort Gresnez, as being insanitary and of primitive construction; and from Guernsey it is reported that the latrines at Fort Hamilton still require alteration. At Guernsey, also, the accommodation in the married quarters is said to be insufficient.

"The ablution room at the hospital at St. Peter's, Jersey, is reported as requiring improvement, also the men's latrine in Fort Regent."

Several sanitary improvements were carried out in Jersey during the year, chiefly at St. Peter's Barracks and Hospital, and further improvements have been proposed to these, as well as to Elizabeth Castle and Fort Regent, to be executed during the succeeding year.

---

*United  
Kingdom.*

*Belfast District.*

The Principal Medical Officer, Deputy Surgeon-General E. M. Sinclair, reports that "the general health of the troops has been good throughout the year.

"Overcrowding has existed in the barracks at Enniskillen, Londonderry, and Newry. Representations have been made on this subject as necessity has arisen, with the result of detachments being sent elsewhere to remedy the evil as far as practicable.

"The general sanitary condition of the barracks is good throughout the district. Ventilation has been good, and the means of ablution sufficient.

"There was no change in the diet of the troops during the year, save that for a short time they received a ration of preserved meat in lieu of fresh once a week.

"The hospitals in the command are fairly satisfactory, with the exception of those at Dundalk and Belfast. In the former there is often insufficient accommodation for the number of sick; it is, however, temporarily added to by the occupation of an adjacent hut. At Belfast, not only is the hospital old and unsuited in many ways, but the accommodation is insufficient for the sick, and it was necessary to supplement it in some months by the use of barrack rooms and tents. The requirements of the hospitals have been brought to notice and submitted in the annual list of improvements.

"The water supply generally has been good and ample during the year, but that at Dundalk is hard in quality. There is, however, a likelihood of a supply from the Town Commissioners main being laid on to the barracks, which will prove ample for all purposes."

Among the alterations and improvements effected during the year may be noted the following: At Belfast an annexe, built to the hospital, containing sinks, urinals, &c., and baths, with hot water laid on; re-appropriation of rooms with quarters and sergeants' mess. At Londonderry improvements to soldiers' huts by fitting them with new pattern heating and ventilating stoves; and provision of Warren's system to cook-houses. At Enniskillen the conversion of married quarters into barrack rooms at Main barracks; and the reclamation of a portion of Lough Erne. At Newry, improvements in drainage and at several other stations various alterations.

---

*Dublin District.*

It is stated by the Principal Medical Officer, Deputy Surgeon-General J. J. Thompson, that the general health of the troops in the district was good during the year, and that the general sanitary condition of the barracks and hospitals at the various stations was favorably reported on by medical officers.

"Owing to the occurrence of several cases of enteric fever in the Richmond Barracks, Dublin, without any apparent cause, the drainage, water supply, and general sanitary condition of the barracks and their surroundings, were made the subject of an exhaustive inquiry. The result has been that several defects in drainage have been brought to light and some old unused drains were discovered, which required filling up. These defects are now being remedied, and many improvements have been already carried out."

Apprehension was expressed by the medical officer in charge at Richmond Barracks, that the present dual water supply, Vartry water being used for drinking and canal water for flushing and washing, might possibly be a source of danger to health, but the Principal Medical Officer does not concur in this opinion. However, he states that there is every probability of an increased water supply being provided for these barracks at no distant date. A considerable number of sanitary improvements were effected in the course of the year, and the following are among the most important:—

In Dublin, at Aldborough House Barracks, a new bakery, with three ovens and a flour store, has been constructed; the whole of the bread for the troops

is made here. At Arbor Hill two blocks of married quarters are in process of construction; at Beggars Bush Barracks the main drainage has been examined and repaired; at Island Bridge arrangements have been made for the provision of new officers' quarters in place of those at present existing, which have been condemned; at Richmond Barracks several sanitary services in connection with drainage were carried out; at the Royal Barracks ventilation beneath ground flooring was effected, and concrete laid down, with the object of remedying dampness which existed, 24 rooms were thus treated; increased accommodation in certain barrack rooms was provided, and several other improvements carried out.

At Naas eight soldiers' wooden huts have been completed, to accommodate 260 men, and a wooden hut for the treatment of infectious disease has been erected in the hospital enclosure. Heating apparatus for water for baths has been provided.

Both at Birr and at Galway an 80-gallon boiler for hot water for the men's baths has been provided; at Boyle and at Athlone certain improvements in drainage, and at other stations various minor sanitary services were effected.

The barracks in Dublin are in many cases old and badly constructed, and would require a large expenditure to bring them up to the requirements of a more modern standard. In the case of the Royal Barracks several structural alterations will probably have to be undertaken. At the same time, it is to be borne in mind that Dublin, as a city, itself requires many sanitary works and improvements.

---

#### *Cork District.*

The Principal Medical Officer, Deputy Surgeon-General S. Fuller, reports that "the health of the troops has, on the whole, been good during the year. A few cases of scarlet, typhus, and enteric fevers have, however, occurred in some of the stations, the two former diseases being prevalent in certain towns, but the precautions of prohibiting communication with the civil population and of isolating the patients were found sufficient to arrest the spread of the disease."

It is pointed out that at Cork a small female hospital is much required, also lunatic wards, the matter has been submitted, and recommended.

At Kinsale a new well has been sunk in the barrack square; the water is pumped up and distributed to the barracks and hospital in cans.

At the station hospital, Queenstown, indoor waterclosets have been provided for each wing. The ground filter tanks have been thoroughly cleaned and repacked, and ventilating shafts erected over sewer pipes. At Forts Camden and Carlisle improvements in drainage were carried out.

It is reported that at Tralee during the year the barracks were put into thorough repair, limewashed, papered, and painted, and gas was introduced.

At Clonmel the drainage generally has been improved, and seven huts, with suitable out-buildings, have been erected, which are favorably reported on. Improvements in the watercloset arrangements were carried out in the artillery barracks.

---

#### *Curragh District.*

The Principal Medical Officer reports that "the general sanitary condition of the Curragh camp and environs, and of Newbridge Barracks, have been satisfactory. The sewage farm, within about half a mile of the foot of the southern slope of the camp, is said to have given off offensive smells at times on account of the water-logging of the soil.

"There has not been any epidemic form of disease during the year, and all requisite sanitary conditions are being fulfilled."

The Principal Medical Officer points out that in comparison with the preceding year there was some increase in the sick rate, which, however, was chiefly among troops in the right wing of the camp, treated at No. 2 station hospital, and at Newbridge, and was due to rheumatic and respiratory affections

*United  
Kingdom.*

principally. He states that the comparative immunity of the troops at the left wing of the Curragh camp, treated in No. 1 station hospital, may be explained by its more sheltered position at the western end.

Among the sanitary improvements which took place during the year are the following: "A number of concrete huts, giving accommodation to 18 men each, have been erected in each wing of camp during the year. They give somewhat more cubic space per man than the wooden huts, and are better lighted, but are only heated by one fire-place. Ventilation is good."

"Two new brick wards have been substituted for huts during the year in No. 2 station hospital, and two more are about to be built with quarters for nursing sisters, and for a warrant officer, also kitchen and convalescent room, all to be connected by a covered verandah at the south end.

"At Newbridge, the drainage and water supply have been much improved."

---

### III.—ON THE HEALTH OF THE TROOPS SERVING IN THE MEDITERRANEAN.

#### *Sickness and Mortality.*

##### I.—GIBRALTAR.

The average strength of the warrant officers, non-commissioned officers, and men serving in the command during the year was 4,353. The force was composed of seven batteries Royal Artillery, four companies Royal Engineers, and detachments Departmental Corps; also of the following regiments, which were in garrison on the 1st January and left for Egypt during the year:—the 1st Battalion Royal Fusiliers, the 2nd Battalion Oxfordshire Light Infantry, the 2nd Battalion Durham Light Infantry, and the 2nd Battalion Royal Dublin Fusiliers; and of the following, which arrived on various dates during the year and remained in garrison at its close:—the 1st Battalion East Yorkshire Regiment, the 1st Battalion Cheshire Regiment, the 3rd Battalion Rifle Brigade, and the 1st Battalion Norfolk Regiment. *Gibraltar.*

The number of admissions to hospital during the year was 4,587; the deaths, including those of invalids after leaving the command, were 35; and the average number constantly sick was 253·58. The ratio of admission was, therefore, 1053·8 per 1,000; that of mortality 8·04; and that of constant inefficiency through sickness 58·25 per 1,000. Compared with corresponding ratios in the preceding year, an increase of 86·9 per 1,000 is observed in that of admission, one of 4·01 in that of mortality, and one of 2·60 per 1,000 in that of constantly sick; and in comparison with average rates for the preceding 10 years, the increase in admission rate amounts to 273·8 per 1,000, and that of constantly sick to 11·54 per 1,000; the increase in mortality rate is 1·38 per 1,000. The average sick time to each soldier was 21·26 days, and the average of duration of each case of sickness 20·17 days, the former being longer and the latter shorter than the corresponding period in the previous year by '89 days, and compared with the average of the preceding 10 years the sick time to each soldier was greater by 4·22 days, but the duration of each case was less by 1·68 days.

The medical officer in charge, Station Hospital, Brigade-Surgeon J. Warren, while remarking on the increase that has taken place in the ratios of sickness and mortality as compared with those of the preceding year, points out that the high rate of mortality is due to the occurrence of two deaths from cholera, three from enteritis, and several from injuries, and that the increase in the invaliding, to be presently noticed, was due to the number of enteric fever cases, which ultimately necessitated change of climate.

The more important of the health statistics of the corps which served in the garrison during the year will be found in Abstract XLII. The lowest admission rates among corps are found in the Royal Artillery and Royal Engineers; it is noticed that these are corps who have served longest in the garrison. The highest admission rate, among regiments which were any time in garrison, is observed in the 1st Battalion East Yorkshire Regiment, and amounted to 1630·6 per 1,000; this regiment, however, shows a low rate of mortality, 1·96 per 1,000, the highest being in the Artillery, 9·83 per 1,000, if the Durham Light Infantry, which was only a short time in garrison, be excluded. High rates of constant inefficiency through sickness are noticed in the Durham and Oxfordshire Regiments of Light Infantry and in the East Yorkshire Regiment, and low rates are found in the Artillery, Engineers, and Royal Fusiliers. The number of changes that took place in the composition of the garrison during the year diminish the value of the statistics in this table.

The admissions and deaths, &c., in the various classes and orders of diseases are shown in Abstract II.

*Gibraltar.*

**GENERAL DISEASES.**—In the *febrile group* of diseases there were 730 admissions, 10 deaths, and 42·36 men were constantly sick, being in the ratios of 167·7, 2·30, and 9·73 per 1,000 respectively. The admission and constantly sick rates are lower than in the preceding year, but the death rate is higher, and compared with the average rates for the previous six years a decline is noticed in all.

*Eruptive Fevers* show one fatal case of scarlet fever. It was admitted from Windmill Hill Barracks, and was of a most malignant type. The cause of the attack could not be traced, and the disease was not prevalent among the civil population. There were also 26 admissions for dengue. The medical officer in charge, Station Hospital, states that "the disease prevailed most extensively among the civil population during the months of September, October, and November, and a great many soldiers were attacked who did not come to hospital. The disease was very infectious, but the attacks were generally very slight; the rash was well marked."

*Enteric Fever* caused 25 admissions, equal to a ratio of 5·7 per 1,000; four of the cases were fatal. In the preceding year there were only three cases, one fatal. The medical officer in charge reports that "the cases were all very tedious, convalescence very prolonged, and the majority were eventually invalidated to England for debility. Relapses were common, and rheumatism frequently supervened during convalescence. The fatal cases showed at post-mortem examination the lesions characteristic of the disease. The cases were distributed from May to December, and the greatest number of admissions in one month was in May. They came from all barracks, the greatest number from any one barrack being 4, from the Grand Casemates. The cause of the disease could not be traced to any defects in the barracks or their vicinity, or in the water supply. It is rather to be looked for in the town, where many of the drains are still very defective."

*Other continued fevers* caused 672 admissions, all but two under the had of simple continued fever. The rate of prevalence of these fevers was 154·3 per 1,000, which is also the average rate of the preceding six years; it is, however, lower than the rate in the previous year by 21·9 per 1,000. The medical officer states that this fever "appears to prevail most in the hot and dry months from May to September. Many cases shown under this heading are very slight, and resulted from different causes, such as exposure to the sun, effects of chill when heated, disordered stomach, &c.; other cases are very severe, and are followed by great debility and protracted convalescence; and others are, in fact, cases of enteric fever, in which the symptoms are not well marked. Of the two fatal cases, one resulted four days after admission from congestion of the brain, the other was twenty-four days under treatment, and was complicated with severe hæmoptysis, which appears to have been the immediate cause of death."

*Paroxysmal Fevers* were represented by two cases of ague occurring in men who had contracted the disease elsewhere.

Two cases of *cholera*, both of which proved fatal, are returned. Brigade Surgeon Warren states that "the first case occurred on 2nd September, and was admitted at 7.30 a.m. from the Flagstaff Guard, where the man had been on duty since the previous morning, having come from No. 1 Hut, North Front. He was attacked three hours previous to admission, and died in the stage of collapse at 1.30 p.m. the following day. The disease did not spread, and there was no connexion between this and any subsequent case or the severe cases of diarrhoea which afterwards occurred. The other case was admitted from Europa Barracks on 7th September at 5 a.m.; became collapsed directly after admission, and death took place on the 9th September. Cholera was prevalent in the village of Linea, and cases had occurred among the civil population of Gibraltar, but the origin of the two cases above described could not be traced. Three very severe cases of diarrhoea, with vomiting, cramps, and great prostration occurred; they were unaccompanied by suppression of urine or rice water evacuations, and were therefore returned as diarrhoea. The first and last cases were admitted from different rooms in the Casemate Barracks on September 5th and 18th respectively, and the second from Europa on the 16th September."

A case of erysipelas and one of influenza completed the diseases of the febrile group.

**Constitutional Group.**—The admissions numbered 1,148, and the deaths, including one after arrival at home, 5; the ratio of admission, 203·7 per 1,000, is higher than that of the preceding year by 73·2, and than the average rate of the previous six years by 103·4 per 1,000. This increase is principally due to venereal disease. The death rate, 1·15 per 1,000, though higher than in the preceding year, is about the average. *Rheumatism* caused 239 admissions, equal to 54·9 per 1,000, which is above the average rate. Of the cases, 26 were of the acute form; some of the cases were very severe and of long duration, but were generally uncomplicated by heart affection. There were 62 admissions for muscular rheumatism, and 149 for the chronic form; many of the latter were very tedious, recurred on the slightest exposure, and 11 cases were invalided. *Primary syphilis* caused 747 admissions, and secondary syphilis 140; the ratios being 171·6 and 32·2 per 1,000 respectively as compared with 127·1 and 21·2 per 1,000 in the preceding year, and with average rates of 94·5 and 13·6 per 1,000. Including gonorrhœa and its sequelæ, the total ratio of admission for venereal diseases was 362·1 per 1,000, and the ratio of constant inefficiency from these affections 21·91 per 1,000; both these ratios are considerably above those of the previous year as well as above the average ratios. 21 admissions for *tubercular diseases* are returned; of these 12 were for phthisis pulmonalis, from which also 5 deaths occurred. The rate of prevalence of these affections, 4·8 per 1,000, is about the average. One case of cancer is returned, and was invalided to England.

**LOCAL DISEASES.**—The ratio of admission for *diseases of the nervous system* was 10·1 per 1,000, higher than in the previous year and nearly double the average rate. Among the admissions were three for meningitis, one of which, resulting from extension of disease of the internal ear, proved fatal. Two admissions for apoplexy occurred; both had a fatal result. There were two cases of sunstroke, one rather severe, but both recovered. There were 11 admissions for mental disease; of these all but one were invalided home. *Ophthalmic affections* were in the rate of prevalence of 19·1 per 1,000, which is higher than usual; out of 83 admissions 51 were due to conjunctivitis. *Diseases of the Ear*, with a ratio of 9·4 per 1,000, were also more frequent.

The ratio of admission for *diseases of the circulatory system* was 12·4 per 1,000, and is above the average ratio by 4·4. Of 54 admissions in all, 15 were due to valve disease of the heart, and 33 to palpitation, the latter chiefly occurring in young soldiers who had become weak and anæmic from fever or the hot weather. Two deaths occurred, one from fatty degeneration of the heart, and one from syncope, in an invalid on board ship. *Affections of the absorbent system* show a diminished admission ratio, 14·5 per 1,000, as compared with 19·7 in the preceding year and an average rate of 20·9. One case of gôitre occurred, the cause of which was unknown; the man was subsequently invalided.

*Diseases of the Respiratory System* caused 124 admissions, of which 99 were due to bronchial affections; 16 to pneumonia, of which two cases were fatal; and 6 to pleurisy. The admission ratio, 28·5 per 1,000, has declined by 7·0 from that in the previous year, and is also below the average.

*Diseases of the Digestive System* caused 430 admissions, equal to a rate of 98·8 per 1,000, which, though slightly above the average ratio, is below that of the preceding year by 10·9 per 1,000. Among the cases treated were 114 of tonsillitis, 81 of diarrhœa, 79 of dyspepsia, 49 of colic, and 36 of hepatic disease, one of the latter, a case of cirrhosis, being fatal. There were also three fatal cases returned as enteritis. These were all admitted from the Casemate Barracks, one on August 3rd and two on August 5th; the duration of the cases were 11, 15, and 23 hours respectively. In all these were vomiting, purging, and cramp, with great prostration. Surgeon-Major Troup in a special report on these cases states that "the symptoms in these cases simulated cholera, but the characteristic and diagnostic rice-water stools were absent. The origin was traced to the partaking of fish improperly prepared, to a mixture of grapes, alcoholic drinks, and excessive water drinking, with, in one case, sea bathing subsequently." Diarrhœa and colic were very prevalent in August and September, and there were three cases of a very severe character. These have, however, already been referred to in the remarks on cholera.

*Diseases of the Urinary System* caused an admission ratio of 172·8 per 1,000, of which 151·4 was due to gonorrhœa alone, as compared with 124·6 in the pre-

Gibraltar.



*Gibraltar.*

ceding year, and 91·0, the average rate of the preceding six years. Among other diseases of the urinary system were three cases of Bright's disease, two of which proved fatal, but one after the close of the year under report. The ratios of prevalence of diseases of the cellular tissue and of the generative system have not varied greatly, but cutaneous affections were rather more common than in the preceding year. One death from lumbar abscess is returned; it occurred in an invalid after arrival at home.

118 admissions for debility caused an increased ratio as compared with the average and with that of the previous year; it amounted to 27·1 per 1,000. Most of the cases were due to enteric or simple continued fever, convalescence from which was very protracted.

Poisons caused 22 admissions, one of which was due to oxalic acid, which was swallowed by a man who had been drinking to excess; the man quickly recovered, but the quantity of the poison he swallowed was not ascertained. The remaining admissions were all due to the abuse of alcohol, three are returned as delirium tremens, and the rest as alcoholic poisoning; among the latter one case proved fatal from exhaustion, the result of incessant vomiting.

Injuries.—There were two fatal cases of multiple injury, one resulting from an explosion during blasting operations, and the other, doubtless, from a fall, as the body was found at the foot of a rock near Europa Point. Local injuries differed very slightly in frequency of occurrence as compared with the previous year. Among the cases may be mentioned the following. A man was found dead at the bottom of a precipice, but at post-mortem examination only congestion of the brain and its membranes, with some bruising, was found, but no fracture. The case was returned as concussion of the brain, but the cause of injury was not discovered. Among 13 cases of fracture was one of fracture of the base of the skull, which proved fatal, the cause was not known. There was also a death from fracture of the skull, caused by the man being crushed against a wall by a cart. There was one case of suicide by gunshot; the man shot himself through the head. There was no evidence as to his state of mind at the time, and no motive for the act could be assigned. There was also an attempted suicide by cut throat, the wound was not severe. The man was insane.

Invaliding.—The number of men invalided home was 171, and that of men finally discharged the service 63, being in the ratios of 39·28 and 14·50 per 1,000 respectively, the former being higher than the corresponding rate in the previous year by 6·18 and than the average rate for the preceding 10 years by 9·55 per 1,000, and the latter higher than the previous year's rate by 4·74, and than the decennial average rate by ·82 per 1,000. Among the causes of invaliding to England were fevers 4 cases, or ·92 per 1,000; rheumatism 12, or 2·75 per 1,000; phthisis pulmonalis 7, or 1·60 per 1,000; nervous affections 12, all but two being cases of mental disease; ophthalmic affections 9; disease of the heart 15 cases, or 3·44 per 1,000, 12 cases being valve disease; and debility 81 cases, equal to 18·61 per 1,000. Compared with the return for the preceding year a considerable decrease would seem to have resulted in the invaliding for fevers: this, however, is more apparent than real, for there is a considerable increase in invaliding for debility, and most of the cases of the latter were due to fevers.

The principal disabilities causing final discharge were phthisis pulmonalis 8 cases, or 1·84 per 1,000; diseases of the nervous system 9 cases, or 2·07 per 1,000; ophthalmic affections 6 cases, or 1·38 per 1,000; and diseases of the circulatory system 13 cases, or 2·99 per 1,000.

Officers.—The average strength of officers was 168, the attacks of illness were 83 in number, there was one death, and two officers were invalided. The ratio of prevalence of sickness was therefore 494·0 per 1,000, that of mortality 5·95, and that of invaliding 11·90 per 1,000. In comparison with the corresponding rates for the preceding year a decrease is observed in all these ratios, to a considerable extent in those of invaliding and mortality. The most prevalent causes of sickness were fevers; among the cases were four of dengue, and one of measles. There was also one case of cholera with fatal result; the officer attacked was living at Europa, no cause could be traced, no connexion existed between this case and one which occurred at Europa five weeks earlier, and no other cases occurred subsequently. The remainder of the attacks of illness were of a varied character, injuries and diseases of the digestive system

causing the most cases. Two officers were invalided on account of attacks of *Gibraltar* fever.

*Women*.—There were 89 attacks of illness and 3 deaths in an average strength of 246 women, being in the ratios of 361·8 and 12·19 per 1,000 respectively. The rate of prevalence of sickness has decreased, but that of mortality increased as compared with the previous year. Among the admissions were 4 for dengue and 14 for simple continued fever, 20 for disorders of the digestive system, 16 for affections of the generative system, and 16 for general debility. The deaths were caused by simple continued fever, syncope, and puerperal convulsions, one case respectively.

*Children*.—The average strength is returned as 485, the attacks of illness 175, and the deaths 10; the ratios per 1,000 were consequently 360·8 and 20·62 per 1,000 respectively. In comparison with the results in the preceding year there is a slight decline in the rate of prevalence of illness, but a considerable decrease in the rate of mortality, that in 1884 having been exceptionally high. Among the attacks were 4 of measles, 4 scarlet fever, 12 dengue, 2 diphtheria, 12 whooping cough, and 23 other febrile diseases. Respiratory affections show 37 cases, digestive disorders 30, and debility 13. The deaths were due to debility in 5 cases, and simple continued fever, whooping cough, atelectasis, gastritis, and diarrhoea, one case respectively.

*Sanitary Conditions*.—The Principal Medical Officer, Surgeon-General A. H. Fraser, states that “the reports of medical officers do not point to any special cause of disease. Cholera appeared in the town during the summer, but the military population almost entirely escaped the disease, two cases only occurring among the men, and one in an officer. No connexion could be traced between these cases, and they occurred on different dates. There has been no defect in the sanitary condition of the barracks, nor anything regarding the water supply which could account for the cases of enteric fever which occurred, nor has the disease been prevalent among the civil population.”

The drainage and conservancy arrangements of the barracks and hospital are reported to have been on the whole satisfactory.

The rations are stated to have been good both in quality and quantity, and no change has been introduced. The means of cooking are satisfactory. The clothing of the men, also the bedding, are said to have been good and suitable to the climate and seasons.

Among the leading sanitary improvements are mentioned the following :—Improvement to the water supply of barracks, ablution rooms, and bath rooms. Provision of two small ablution rooms to the commissariat bakery. The erection of staff sergeant's quarters, and some sheds at the South Barracks. Improvements in the drainage of field officers' quarters in the Europa Main Road, and ventilation of drains in officers' quarters in Southport Street. At the Town Range Barracks improvements in the schoolroom, particularly as regards ventilation. At the Station Hospital ventilating tubes over gas burners were provided, and four sculleries attached to wards were erected, two in the upper corridors, and two in the lower; also certain improvements to water supply. In addition to the above, ventilation of drains, disconnexion of overflows from rain water tanks with main sewers, &c., and sundry small sanitary services were carried out.

## II.—MALTA.

The average strength of warrant officers, non-commissioned officers, and men serving in the garrison during the year was (with the exception of the Royal Malta Fencible Artillery) 4,602. The force was composed as follows :—Eight batteries Royal Artillery, two companies Royal Engineers, the 1st Battalion Hampshire Regiment, detachments Departmental Corps, and garrison staff, throughout the year. The 2nd Battalion Royal Irish Regiment, the 2nd Battalion Royal Sussex, and the 1st Battalion Shropshire Light Infantry, all

*Malta.*

of which were in garrison on the first day of the year, left on the 7th January, 20th January, and 27th February respectively. The 1st Battalion East Kent Regiment arrived on the 9th February and left on the 12th September, and the 1st Battalion Dorset Regiment arrived on the 12th March, and left on the 26th September. The 2nd Battalion South Yorkshire Regiment, the 1st Battalion Gordon Highlanders, and the 1st Battalion Duke of Cornwall's Light Infantry, arrived on the 6th January, 12th September, and 29th December respectively, and were all in the garrison at the close of the year.

The admissions to hospital numbered 4,249, the deaths, including those of invalids after having left the Command, 68, and the average number constantly sick 272.04. The ratio of admission per 1,000 of strength was, therefore, 923.3, that of mortality 14.77, and that of constant inefficiency through sickness 59.11. Compared with corresponding rates for the preceding year an increase is observed in all, amounting to 82.9 per 1,000 in the case of admission, 5.50 in that of mortality, and 3.27 per 1,000 in that of constantly sick. In comparison with similar average rates for the preceding 10 years an increase in these ratios is also noticed, the admission rate being greater by 67.1 per 1,000, the death rate by 4.93, and constantly sick rate by 9.70 per 1,000. The average sick time to each soldier was 21.57 days, and the average duration of each case of sickness 23.37 days, the former being longer than the corresponding period in the previous year by 1.14 days, and than the average period in the previous 10 years by 3.54 days; while the latter is shorter than in the foregoing year by .94 days, and longer than the average duration in the preceding decennial period by 2.31 days.

The most important of the health statistics of the different regiments and corps are given in Abstract XLII.

The 1st Battalion Dorsetshire Regiment gave the highest ratios of admission and constantly sick, being 1465.8 and 114.48 per 1,000 respectively. The Principal Medical Officer, Surgeon General J. Sinclair, attributes this "to the inferior physique and great youth of the men, which rendered them quite unable to endure the unusual heat of the past summer." The medical officers who were in immediate connexion with the regiment express similar opinions, and all point out that the spring of the year was the most unfavourable time in which the regiment could have arrived in the Command. The Principal Medical Officer also concurs in this view, and states that he notices that regiments arriving in the island in the spring suffer much from fever during the following summer and autumn. The mortality rate in this regiment was low, but the invaliding rate was high, 54.29 per 1,000, and was increased by some men, who were unfit to proceed with the regiment to Egypt, being sent home for change. The admission rate for the Gordon Highlanders was also high, 1344.9 per 1,000, followed by the 2nd South Yorkshire Regiment, 1055.9, and by the 1st East Kent Regiment, 972.4 per 1,000. The Royal Engineers show a high rate of mortality, 40.81 per 1,000, and high rates are also observed in the 1st East Kent, the Royal Sussex Regiment, a battery of Artillery, and in Departmental Corps. Invaliding was high in the Artillery, in the Shropshire Light Infantry, and in the East Kent Regiment. With regard to the ratios of constant inefficiency through sickness it is observed that after the high rate already mentioned for the Dorset Regiment, come 73.10 per 1,000 for the Gordon Highlanders, 71.00 for the Shropshire Light Infantry, 67.40 for the Royal Sussex, followed by lower ratios for other corps.

The admissions, deaths, invaliding, &c. in the various classes and orders of diseases are shown in Abstract No. III.

**GENERAL DISEASES.—Febrile Group.**—The number of admissions for febrile affections was 1,034, and of deaths 34, being equal to ratios of 224.7 and 7.39 per 1,000 respectively. The average number constantly sick was 94.17, or at the rate of 20.46 per 1,000. These ratios show a considerable increase of prevalence of sickness and mortality, both as compared with the preceding year, and with the average of the previous six years. In the former comparison the increase of admission rate amounts to 65.8 per 1,000, of death rate to 2.42, and of constantly sick rate to 5.85 per 1,000, while in the latter the admission rate is increased by 48.3, the mortality rate by 3.49, and the constantly sick rate by 9.44 per 1,000.

*Eruptive fevers* were the cause of four admissions : two of small-pox and one of scarlet fever and measles respectively. The cases of small-pox occurred simultaneously, one at Valetta, and the other at Cottonera; they were severe, but recovered. It is understood that the disease was introduced by sailors at the lazaretto, and 39 cases occurred in the civil population, but careful preventive measures having been undertaken, it did not spread further among the military.

*Enteric fever* caused 93 admissions and 24 deaths, the ratio of admission being 20·2, and that of mortality 5·22 per 1,000. The admission ratio is almost identical with that of the previous year, but is in excess of the average of the preceding 6 years by 4·4 per 1,000, while the mortality rate is increased in the former comparison by ·48 and in the latter by 1·86 per 1,000. The deaths were equal to 35 per cent. of the deaths from all causes. The number of deaths to attacks was at the rate of nearly 26 per cent., being higher by 2·4 than in the foregoing year. Of the cases, 14, with 6 deaths, occurred at Valetta, and 74, with 15 deaths, at Cottonera. It is stated by the Principal Medical Officer that this discrepancy is probably due to "the improved water supply of Valetta, while that of Cottonera remains much the same as before." The remaining five cases occurred at Civita Vecchia; among them were 3 deaths.

The medical officer in charge at Cottonera remarks that "enteric fever was much more prevalent in this district during the past year than usual, and gave rise to more than half the deaths. It was very fatal during the hot months, and the year was one of the hottest ever known in Malta. The total deaths were 20 per cent. of the admissions. The prevalence of the disease was probably owing to the large number of young soldiers exposed to the poison and to the insanitary condition of the houses frequented by them outside barracks." Many of these houses thus alluded to were placed out of bounds until their condition was improved, and certified by the police physician to be free from nuisance.

*Other continued fevers* caused 837 admissions and 5 deaths, the ratio of admission being 181·9 per 1,000, an increase of 67·4 per 1,000 on the previous year's rate, and above the average rate by 40·0 per 1,000. Febricula caused 495 admissions, and simple continued fever 342 admissions and 5 deaths. The medical officer in charge of Cottonera states that the majority of the cases were mild in character, and apparently due to irregularity or exposure; but some of the cases of simple continued fever were very prolonged, with frequent relapses, and followed by glandular swellings or muscular and neuralgic pains. The patients remain a long time weak and anæmic and unfit for active work.

*Paroxysmal Fevers* caused 96 admissions and 3 deaths; the ratio of admission was 20·9 per 1,000, differing only fractionally from the last year's rate but considerably above the average. Ague was the cause of 24 admissions; and remittent fever 72, also of the three deaths. The cases of ague are said to have been contracted elsewhere. With regard to remittent fever the Principal Medical Officer remarks that in Malta it is an irregular form of the disease, not well understood, and which is often named Maltese fever. In some of the cases many of the symptoms of enteric fever present themselves, but their pathology is quite distinct from that disease. Quinine does not exercise the same beneficial effect in these so-called remittent fevers as in the remittents of the tropics. Antipyrin in 30 grain doses is mentioned as being most efficacious in reducing temperature and affording relief to the headache and restlessness so much complained of.

*Other diseases* of this group include 3 cases of erysipelas, and one of diphtheria; the latter was very severe and proved fatal in four days. Another case, which remained from the previous year, also proved fatal. It is stated that this disease is epidemic among the civil population, as many as 536 cases being recorded during the year.

*Constitutional Group*.—546 admissions and 12 deaths are recorded, being in the ratios of 118·7 and 2·61 per 1,000 respectively. Compared with corresponding rates in the previous year, that of admission has declined by 4·9 per 1,000, but that of mortality has increased by 1·32 per 1,000; while both are above the corresponding average ratios for the preceding 6 years, the former by 24·9 and the latter by ·89 per 1,000.

Malta.

*Rheumatism* caused 230 admissions; of these 85 cases were rheumatic fever, one case being fatal. The ratio of prevalence of rheumatic affections, 50·0 per 1,000, is above the rate in the previous year by 15·5 per 1,000, and also above the average rate. A good many of the cases of the muscular form of rheumatism were, it is stated, the sequelæ of fevers.

*Primary Syphilis* caused 172 admissions, and secondary syphilis 102; the ratios being 37·4 and 22·2 per 1,000 respectively. The ratio of prevalence of primary syphilis is almost identical with the average rate of the previous six years, but is below the preceding year's rate by 7·7 per 1,000, while the ratio of secondary syphilis, though it has declined by 6·1 per 1,000 as compared with the previous year, is still considerably above the average rate. Including gonorrhœa and its sequelæ, the admission rate for all forms of venereal disease was 126·7 per 1,000, being higher than that in the preceding year by 1·3, and than the average rate by 5·3 per 1,000. The rate of constant inefficiency from these affections was 8·99 per 1,000, which, though below the corresponding rate in 1884, is still slightly above the average.

34 admissions for *tubercular disease* are returned; of these 22 were for phthisis pulmonalis. The deaths from phthisis pulmonalis, including three of invalids, numbered 11. The ratio of admission for tubercular affections, 7·4 per 1,000, is about the average, but it is lower than in the preceding year by 2·7 per 1,000. The mortality ratio, 2·39 per 1,000, is more than twice that in 1884, and also considerably above the average.

The remaining admissions for diseases of the constitutional group were one case of purpura hæmorrhagica, one of diabetes, 2 of general dropsy, and 4 of anæmia.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused 60 admissions and 3 deaths; the ratio of admission was 13·0 per 1,000, which is about the average rate, and compares favorably with 17·9 in the preceding year. Among the cases treated were 10 of epilepsy, 1 of sunstroke, 3 of apoplexy, 30 of some form of neuralgia, many of them being the sequel of fevers, and 12 of mental disease. All the deaths were caused by apoplexy.

*Diseases of the Eye and of the Ear* gave admission rates of 14·8 and 6·5 respectively, which compare favorably with average rates and those of last year.

*Diseases of the Circulatory System* caused 78 admissions and 2 deaths, including one of an invalid after arrival at home. The rate of admission, 16·9 per 1,000, is below that of the previous year and fractionally above the average rate. Among the cases were 19 of valve disease of the heart and 56 of palpitation. The deaths were due to syncope, and valvular disease respectively. *Respiratory affections* gave 142 admissions and 3 deaths, the admission rate, 30·9 per 1,000, has declined from that in the preceding year by 6·4 and is under the average rate by 7·9 per 1,000. The majority, 104, of the admissions were due to bronchitis, and there were 22 cases of pneumonia and 11 of pleurisy. Of the deaths, two are referred to pneumonia and one to bronchitis.

The admissions for *digestive affections*, 579, equal to a ratio of 125·8 per 1,000 of strength, which, while it differs very little from the average rate, is higher than that of 1884 by 14·1 per 1,000. The chief causes of admission were tonsillitis and throat affections, dyspepsia, and diarrhœa; there were also 54 cases of hepatic disease and 40 of dysentery. Concerning the latter disease the medical officer in charge at Cottonera remarks: "32 cases were admitted; these were almost confined to soldiers lately returned from Egypt. The men attributed the disease to the unsanitary state of the camp at Mex, Alexandria, where they were stationed; they had previously been healthy." Four deaths occurred, 2 from dysentery among the cases at Cottonera above alluded to, one from internal strangulation of the colon, and one, an invalid at Netley, from abscess of the liver.

Among *urinary affections* gonorrhœa and its sequelæ caused 309 admissions, equal to 67·1 per 1,000 of strength; this rate exceeds that in 1884 by 15·1, but is below the average rate by 4·0 per 1,000. Other affections of this system were somewhat less frequent in both comparisons. The ratios of admission for *diseases of the generative system, organs of locomotion, and cutaneous system* are all slightly above the average rates as well as the corresponding rates in the previous year, but the admission rate for *diseases of the cellular*

*tissue* is considerably higher than last year's rate, and than the average of the rates of the preceding six years. None of the cases in these orders call for any special mention.

47 cases are recorded under the head of *debility*; they were chiefly the result of fevers and the effects of climate. The admission ratio, 10·2 per 1,000, though about the same as in the previous year, is a good deal below the average. 22 admissions for *poisons* are returned, all resulting from alcoholic excess. One case is shown as *delirium tremens*; it proved fatal, as also did two cases returned as alcoholic poisoning.

*Injuries*.—2 admissions and 2 deaths are returned under the head of multiple injury; the admissions were due to falls, one from a barrack room window, about 30 feet from the ground, and the other over Marsamuscetto curtain; both these cases recovered. The deaths were also due to falls over battlements, one at Fort San Leonardo and the other at St. Clements. There were also two accidental deaths from drowning while bathing. Local injuries, caused 499 admissions and 3 deaths, the ratio per 1,000, 108·4, being slightly above the average. The great majority of the cases were sprains, contusions, wounds, &c. of ordinary character. There were 15 cases of fracture, of which one had a fatal result. A man of the Royal Engineers fell from a terrace in the lower courtyard of the Valetta station hospital and fractured his skull. Two other deaths occurred, both suicides, one a corporal, East Kent Regiment, cut his throat, no motive or mental aberration could be discovered in this case; the other, a canteen sergeant of the same regiment, shot himself through the head; in this instance irregularity of his accounts was believed to have been the cause.

*Invaliding*.—124 men were invalided home, and 57 men were finally discharged the service as medically unfit, being in the ratios of 26·94 and 12·38 per 1,000 respectively. In comparison with corresponding rates in the preceding year a decrease of 3·47 is observed in the former, and one of 5·51 per 1,000 in the latter; while compared with decennial average rates, invaliding has declined by 2·44 and final discharge by 3·43 per 1,000. Among the causes of invaliding to England were the results of fevers, 26 cases, or 5·65 per 1,000 of strength; rheumatism 5 cases, or 1·09 per 1,000; and phthisis pulmonalis 11, or 2·39 per 1,000. Diseases of the nervous system, caused invaliding in 21 cases, 13 of which were due to mental affection, the ratio to strength was 4·56 per 1,000. Heart disease, chiefly valvular, necessitated invaliding in 20 cases, or 4·34 per 1,000. Respiratory and digestive affections each caused the invaliding of 8 cases, injuries of 7, and urinary diseases and debility of 5 cases respectively. Compared with the previous year the invaliding ratio for fevers has increased, and those for phthisis pulmonalis, cardiac, and nervous diseases have decreased.

The principal causes of discharge by invaliding were nervous affections 13 cases, equal to 2·82 per 1,000; circulatory diseases 12 cases, or 2·61 per 1,000; phthisis pulmonalis 7, or 1·52 per 1,000; debility 6 cases, 1·30 per 1,000; and rheumatic affections 5 cases, 1·09 per 1,000.

*Officers*.—The average strength of officers was 142. There were 76 cases of illness, 4 deaths, and 8 officers were invalided home. The ratio of prevalence of sickness was therefore equal to 535·2 per 1,000, that of mortality 28·16, and that of invaliding 56·33 per 1,000. Compared with corresponding ratios in the previous year, a slight decrease is observed in all of them, being 5·1 per 1,000 in the case of prevalence of sickness, 28·9 in that of mortality, and 5·78 per 1,000 in that of invaliding. Very nearly half the attacks of illness were due to febrile disorders, of which remittent fever caused 5 attacks and one death. Among other illnesses were 20 affecting the digestive system, including 4 cases of hepatic affection, 2 of dysentery, 1 case fatal, and 6 diarrhoea. The remaining deaths were due to pleurisy and apoplexy, one case of each. The causes of invaliding were fevers 3 cases, ophthalmic affections, 2 cases, and hepatitis, concussion of the brain, and sprain, one case respectively.

*Women*.—The average strength is returned as 298, and there were 241 cases of sickness and 6 deaths. The ratio of prevalence of sickness equalled 808·7 per 1,000 and that of mortality 20·13 per 1,000, both of which show a decline as compared with similar rates in the preceding year, in the former case one of 84·5 per 1,000, and in the latter 8·33 per 1,000. Fevers caused 61 attacks of illness, among which were four cases of enteric fever, and one of

*Malta.*

remittent fever. Rheumatism was the cause of 9 attacks of illness, nervous diseases 12, ophthalmic affections 14, diseases of the respiratory system 12, of the digestive system 42, and of the generative system and connected with pregnancy 15, &c. The deaths are returned as follows: enteric fever two cases, and simple continued fever, cancer, and phthisis pulmonalis, one case respectively; also one from wound of throat, self-inflicted.

*Children.*—In an average strength of 501 children, there were 488 cases of sickness and 53 deaths, being in the ratios of 974 and 105·78 per 1,000. These ratios show a considerable increase on the corresponding rates for 1884, that of prevalence of sickness showing an excess of 337·9 per 1,000, and that of mortality one of 28·86 per 1,000. Among the cases treated were 44 of measles, 2 of which ended fatally, 7 of scarlet fever, 29 of continued fevers, 2 of remittent fever, and 12 of diphtheria with 3 deaths. Of the last-named disease 5 cases occurred at Cottonera, and 7, including the fatal cases, at Valetta. It is stated that the cases were severe, and the disease was very prevalent among the civil population throughout the island. Among other prevalent affections were whooping cough 20 cases, ophthalmic disorders 54, bronchial affections 69, diarrhoea 82, teething 18, and debility 19 cases. Besides those above mentioned, 6 deaths were caused by infantile convulsions, 5 by tabes mesenterica, 1 by tubercular meningitis, 6 by bronchitis, 4 by teething, 3 by ulcerated throat and tonsillitis, 2 by enteritis, 3 by dysentery, 12 by diarrhoea, 4 by premature birth, and 2 by debility.

*Sanitary Conditions.*—Surgeon-General J. Sinclair, Principal Medical Officer, remarks that “the barracks, forts, camps, hospitals, &c. occupied by the troops are numerous and widely scattered. Many are of very antiquated construction and faulty in position, ventilation, and general hygienic condition, while some have already been officially condemned as unfit, although, through military necessity, they still in many instances continue to be occupied. All defects capable of improvement have, as far as possible, received due attention, and every care has been taken to keep all quarters, &c. in as good sanitary condition as possible, but in many instances recommendations were found to be impracticable, either for military reasons or for want of funds, and some were postponed to be included in the estimates for the next year.

“The main system of drainage in Floriana and Valetta is now complete, and is flushed by a steam pump at St. Elmo. For some time, however, previous to the erection of the latter, and owing to a breakdown of the former pumping arrangement, which was worked by a windmill, considerable inconvenience was experienced, as the sewage was retained in the receiving sewers by means of a sluice or valve, until sufficient was accumulated to move it forward, and in consequence of this retention emanations arose which tended to vitiate the atmosphere.

“The system of rain water catches (for drinking purposes) on roofs, ram-parts, enclosures, &c. is, as already often represented, objectionable and dangerous, as is also the practice of storing it underground in tanks, where it is liable to become contaminated by percolation of sewage, washings from streets, &c. The aqueduct supply is now, however, undergoing thorough reconstruction, by which the water will be conveyed to the town in iron pipes and delivered direct to the various houses and barracks, all risk of pollution or loss being consequently prevented.

“During the summer months (from May to October) with a view of giving increased space, half the men from the various barracks slept in tents at night.

“At the beginning of April five companies of the 2nd South Yorkshire Regiment were moved from the Verdala barracks to the forts on the eastern extremity of the island about five miles distant. The men were encamped on the glacis of the forts, but during the day time occupied the rooms within and had their dinners there. In this manner, though the weather was extremely hot, the troops enjoyed excellent health.”

With regard to the different barracks and hospitals, the following points are mentioned in the reports of medical officers. At Floriana barracks, the position of which is said to be objectionable on account of their proximity to the civil hospital, some of the rooms being actually underneath the hospital wards, a good deal of fever occurred. Various sanitary recommendations were made

in consequence, among which were that the number of men in each room should be reduced so as to give greater cubic space, that the water drank should be only that from the aqueduct, &c. *Malta.*

At Marsamuscetto the cook-house was enlarged, and an additional outlet shaft constructed in the roof of each barrack room near its centre; but increased ventilation is still required at the inner end of each room, which is casemated.

The health of the troops in the Sliema district is very good, and the sanitary condition of Forts Tigne, Sliema, and Cambridge satisfactory. At Fort Manoel the staircases in the small rooms should be removed in order to give increased accommodation, light, and ventilation.

Lower St. Elmo is said to be faulty as to position and construction, and the defects cannot be remedied, being of a radical nature. The lower rooms are not used as living rooms but as kitchens, canteen, &c., and every effort has been made to keep the barracks in as good a sanitary state as possible.

At Fort Ricasoli the married quarters are not sufficiently large. A kitchen is also required for the detachment Royal Artillery, as the infantry cook-house, now used for both, is too far off. Certain improvements in latrines which are required are about to be carried out.

Verdala barracks, as well as those at St. Clement's bastion, are reported to have been in good sanitary condition, but the ventilation of Isola Gate and Polverista barracks is mentioned as defective.

At Valetta station hospital some minor improvements were effected, and all repairs required to the buildings were carried out, also improvements in the drainage.

The following requirements for the Cottonera station hospital are put forward: A hospital for infectious disease, and increased accommodation for the men of the Medical Staff Corps.

At Forrest station hospital six wards have been re-floored during the year, and the remainder are to be done in the next year. At this hospital also, it is said, a detached building for the treatment of infectious diseases, and a room for disinfection of bedding clothes, &c. of such cases are required.

Several improvements to the Sanitarium, Civita Vecchia, have been carried out with regard to ventilation and accommodation, and various propositions for the further improvement of the hospital have been included in the estimates for the succeeding year.

Fort Chambray, Gozo, was occupied by the headquarters and four companies of the 1st Dorsetshire Regiment during the last three months of the year. The medical officer points out that if this fort is to be permanently occupied considerable improvements will be necessary to the barracks to make them fit for occupation, the chief points being repair of the barrack room floors, the provision of fireplaces, ventilation of the rooms, and improvements in drainage and latrine accommodation.

#### ROYAL MALTA FENCIBLE ARTILLERY.

The average strength of the Royal Malta Fencible Artillery was 353 non-commissioned officers and men; the number of admissions into hospital was 290, there were 9.39 men constantly sick, and one death occurred. The ratio of admission was therefore 821.5 per 1,000, that of mortality 2.83 per 1,000, and that of constant inefficiency through sickness 26.60 per 1,000. Compared with corresponding rates in the previous year an increase of 161.6 per 1,000 is observed in admission rate, one of 2.83 in death rate, and one of 4.41 per 1,000 in the rate of constantly sick; while in comparison with decennial average rates there is an increase of 162 per 1,000 in the rate of admission, and a fractional increase in constantly sick rate, but there is a decrease in the rate of mortality, equal to 3.64 per 1,000.

The average sick time to each soldier was 9.71 days, and the average duration of each case of sickness 11.81 days, the former being longer than the corresponding period in the previous year by 1.59 days, and the latter shorter by about half a day. Compared with average periods for the preceding 10 years, however, there is only a fractional increase in the average sick time, and there is a decrease of 2.42 days in the average duration of each case.



*Malta.*

The admissions and deaths in the different classes and orders of diseases are shown in Abstract IIIa.

**GENERAL DISEASES.**—*Febrile Group.*—48 admissions are shown under this head, equal to a ratio of 135·9 per 1,000, as compared with 95·1 per 1,000 in the previous year; it is, however, identical with the average rate for the preceding six years. 45 of the admissions were due to febricula, and the remaining two to enteric and remittent fever respectively. The case of remittent fever had a fatal termination; that of enteric fever was severe, but ultimately recovered, it occurred in a young soldier of three months' service; no cause for the disease could be traced.

*Diseases of the Constitutional Group* caused 31 admissions, equal to 87·9 per 1,000 of strength, which is more than double the rate in the preceding year, and also considerably above the average; 24 of the cases were rheumatism, 2 primary syphilis, 3 secondary syphilis, and 2 tubercular affections.

**LOCAL DISEASES.**—The admissions in the different orders of local diseases were not generally numerous; the highest admission rate was 133·8 per 1,000 for diseases of the digestive system, which is rather above last year's rate as well as above the average. The principal diseases causing admission were tonsillitis and dyspepsia. Cutaneous diseases gave the next highest admission rate, 93·5 per 1,000. These affections were more prevalent than usual, boils and whitlows causing most of the admissions. Respiratory affections numbered 27, equal to 76·5 per 1,000; all the admissions were due to bronchitis, and most of the cases were very mild. Conjunctivitis caused a few more admissions than in the last year, but only 14 in all, and most of the cases were mild in character.

*Injuries* caused 57 admissions, equal to a ratio of 161·5 per 1,000, which is higher than the average rate. Contusions, wounds, and blisters of the feet caused most of the admissions. There was one case of homicidal wound. A gunner stabbed a corporal between the ninth and tenth ribs on the right side posteriorly; the patient recovered. A man on fatigue duty had his right hand caught between two wheels of a crane, one half of the index and middle fingers were crushed; amputation was necessary, and the man was doing well at the date of report.

*Invaliding.*—Four men were discharged the service by invaliding, the ratio per 1,000 of strength being 11·33 as compared with 11·52 in the preceding year; both these years, however, have rates below the average by nearly one half. The disabilities necessitating discharge by invaliding were fatty degeneration of the heart, imbecility, bronchitis, and general debility, one case respectively.

*Officers.*—The average strength during the year was 20, and there were 19 cases of sickness. Febricula caused 6 of the illnesses, but beyond this there was no prevalence of disease. No death occurred.

*Women and Children.*—The average strength of women was 33, and there were 9 single cases of different diseases, which call for no special remark. In an average strength of 104 children there were 70 attacks of illness and 6 deaths. The attacks of illness were more than twice as numerous as in the previous year, but this was chiefly due to the prevalence of measles, which alone caused 34 cases. Among the remaining cases were 7 of diarrhoea and 11 of teething. The deaths were caused by teething, 3 cases, and measles, tabes mesenterica, and diarrhoea, one case respectively.

*Sanitary Conditions.*—Surgeon L. Manché, M.D., the medical officer in charge, reports that "the sanitary condition of Fort Lascaris, as well as that of Fort St. Lucian, St. Leonardo, and Delimara, and the guard-rooms at St. Antonios Gardens, at present occupied by small detachments of the regiment, has been carefully attended to during the year.

"The ventilation was sufficient, and there was no overcrowding in the barrack or guard rooms. The only part of the barracks which is not as hygienic as it should be is that occupied by the latrines, which are built in a casemate and badly ventilated.

"The married quarters, the Camerata buildings, are healthy enough, are kept clean, well supplied with water from the aqueduct, and do not present any cause of disease."

The medical officer states that the rations were of good quality, and the cooking varied as much as possible, but he repeats his recommendation that the meat ration should be increased in quantity. The clothing, bedding, &c. is satisfactorily reported upon.

*Recruiting.*—Out of 111 recruits inspected during the year 57 were found fit for service, and 54 rejected. The previous occupations of recruits inspected were labourers, &c. 82, tradesmen 16, mechanics 7, students, &c. 3, and boys under 17 years of age, 3. Among the causes of rejection were 13 for defective vision, 12 for being under weight, 11 for being under chest measurement, and 9 for cardiac disease.

Omitting boys under 17 years of age, the number of recruits inspected was 108; among these the average age was 19·9 years, the average height 5 feet 4½ inches, the average weight 122 lbs., and the average chest measurement 32½ inches. With regard to education, out of the 111 inspected one recruit only is returned as well educated, 25 recruits as able to write, 2 as able to read only, and 83 as unable to read.

### III.—CYPRUS.

The Senior Medical Officer, Brigade-Surgeon G. Elmsley Will, reports that the average strength of warrant officers, non-commissioned officers and men was 852, and that the force was composed as follows: the headquarters and four companies of the 3rd Battalion King's Royal Rifles, Departmental Corps, and Garrison Staff throughout the year. In July the usual garrison was augmented by the arrival of the following regiments from Egypt for change, the 3rd Battalion Grenadier Guards, 1st Battalion Coldstream Guards, 2nd Battalion Scots Guards, and, in August, half of 1st Battalion Shropshire Light Infantry, and a detachment of Artillery, making a total of 3,020 officers, non-commissioned officers, and men; these were all encamped on Mount Troodos. The Guards came from Ramleh Barracks, Alexandria, where they had only been a short time; they had been through a trying, though short, campaign near Suakin, and had been brought from thence in troopships to Alexandria, where they had remained on board ship anchored in the harbour for six weeks before they went to Ramleh. The Shropshire Regiment and the Royal Artillery came direct from Suakin.

The total number of admissions into hospital was 918, of deaths 18, including that of an invalid after arrival at home, and of constantly sick 37·15, being in the ratios of 1077·4, 21·13, and 43·60 per 1,000 respectively. Compared with the corresponding ratios for the preceding year, that of admission is increased by 323·9, that of deaths by 4·97, and that of constantly sick by 11·83 per 1,000, and compared with the average similar ratios for the previous 6 years, there is an increase of 139·9 per 1,000 in ratio of admission, one of 10·18 in that of mortality, and one of 2·00 per 1,000 in that of constantly sick. The average sick time to each soldier was 15·91 days, and the average duration of each case of sickness 14·80 days, the former being longer than the corresponding period in the preceding year by 4·28 days, and the latter shorter by ·63 days, and, compared with the average periods in the preceding six years, a fractional increase is observed in the former, and a decrease of 1·40 days in the latter.

With regard to the increase of sickness and mortality in the year under report, the Senior Medical Officer remarks that “the high ratios are due to the arrival of the battalions from Egypt, the men being in a very sickly and debilitated condition from the hardships of the recent campaign at Suakin, and to enteric fever having broken out among them. A somewhat similar increase in sickness and mortality occurred in 1882, when the Royal West Kent Regiment arrived from Egypt under similar circumstances. During the four months from June to October, there were in all 580 admissions to hospital; the number admitted during July and August was 264 and 168 respectively, and it was during these two months that the Brigade of Guards were encamped on Mount Troodos.”

From the commencement of the year to the 1st June the infantry were stationed at Polymedia and the Departmental Corps at Limassol. The troops

*Cyprus.*

then marched for Troodos, returning to their former quarters early in October. On 1st December, one company King's Royal Rifles was sent to Nicosia. The Guards left on the 25th August, and the Shropshire Light Infantry and Artillery on 14th November.

In Abstract XLII. will be found the more important health statistics of the corps which served in the Command. Of the permanent garrison it will be noticed that the ratio of admission of the King's Royal Rifles, 1113·8 per 1,000, differs very slightly from the annual ratio of that corps in the preceding year, but the mortality ratio, 4·84, shows a decrease; the admission and mortality ratios of the Garrison Staff and departments are higher than in the preceding year. Among the troops from Egypt, temporarily in the garrison, the highest annual ratio of admission was 1333·3 per 1,000 in the Coldstream Guards, and the highest annual ratio of mortality, 50·50 per 1,000, in the same regiment.

The admissions and deaths, &c. in the different classes and orders of diseases are shown in Abstract IV.

**GENERAL DISEASES.**—*Febrile Group.*—There were 318 admissions for febrile affections, 15 deaths, and 11·86 men were constantly sick on account of them, being in the ratios of 373·2, 17·61, and 13·92 per 1,000 respectively. The ratio of admission is higher than the corresponding rate in the preceding year by 112·6, that of mortality by 15·59, and that of constant inefficiency by 7·80 per 1,000, and compared with average similar rates for the preceding six years there is also an increase in these ratios, being 78·2, 14·07, and 4·71 per 1,000 respectively. The cause of the general increase in these ratios was, with regard to mortality, the prevalence of enteric fever, but with regard to admission, though there were a considerable number of cases of enteric fever, the prevalence of other continued fevers was much less, but there was a very marked increase of paroxysmal fevers; the increase in the constantly sick rate was due both to enteric and paroxysmal fevers.

*Enteric Fever* caused 51 admissions and 15 deaths, including that of an invalid, being in the ratios of 59·8 and 17·61 per 1,000 respectively, those in the preceding year being 4·0 and 2·02 per 1,000. Of the admissions, 42 and 10 deaths occurred at Troodos, 9, with 3 deaths at Polymedia after return from Troodos, and one fatal case at Platris, at the foot of Mount Troodos, was a transfer from the latter station. The disease broke out after arrival of the Guards, and the late Surgeon-Major Connellan, medical officer in charge, remarks in his report on Mount Troodos that, "During the two years I have been in charge of the military hospitals at Cyprus I never saw a case of enteric fever amongst the men of the garrison, except amongst men just arrived from Egypt, as in three cases last year from Ramleh."

There were 34 admissions for simple continued fever, and 51 for febricula, being in the ratio of 99·8 per 1,000, which is less than half the rate in the preceding year, though above the average rate by 14·5. It is stated that there is reason to believe that some of the cases of simple continued fever may have been mild cases of enteric fever. The cases of febricula were due generally to exposure to the sun, but were of short duration and yielded readily to treatment.

*Paroxysmal Fevers* caused 180 admissions, equal to a ratio of 211·3 per 1,000, as compared with 48·5 in the preceding year. There is, however, no such marked difference when compared with the average rate of six years, which is 201·3 per 1,000. Of the cases, 177 were ague and 3 remittent fever. 16 cases of ague occurred at Polymedia between January and May, and 60 in October, November, and December. The medical officer in charge was inclined to think that this disparity was due to the change from the cold of Troodos at the latter end of September to the heat of Polymedia in a few hours. At Troodos there were 92 admissions for ague, 35 of which occurred in the half battalion King's Royal Rifles in June, before the arrival of the Guards. The explanation given of this was that a heavy local fall of rain took place on Mount Troodos just before the Rifles marched up, and the whole camp was in a sodden condition. In July and August the admissions fell to 25 and 11 respectively, and rose again in September to 22 after the occurrence of some very heavy showers. The cases of remittent fever occurred at Polymedia, Platris, and Troodos respectively, and were all of a mild character.

The *Constitutional group* of diseases caused 97 admissions, equal to a ratio of 113·9 per 1,000, higher than the ratio in the previous year by 10·9, but lower

than the corresponding average rate by 22·0 per 1,000. *Rheumatism* was the cause of 7 admissions, only one case was of the acute form. 55 admissions are recorded for *primary syphilis*, and 34 for *secondary syphilis*, the ratios of admission being 64·6 and 39·9 per 1,000 respectively, as compared with 76·8 and 22·2 in the preceding year, and with corresponding average ratios of 72·1 and 37·4 per 1,000. It is stated that some of the cases were brought from Egypt, but that the disease is also very prevalent in the island. Including gonorrhœa and its sequelæ, the total ratio of admission for venereal affections was 162·0 per 1,000, being below the average rate by 30·9, and below the rate in the preceding year by 36·0 per 1,000. The ratio of constant inefficiency on this account was 8·63 per 1,000, which compares favorably with 12·16 in the preceding year, and with 12·96 per 1,000, the average rate of the previous six years. As in the preceding year, only one case of phthisis pulmonalis occurred, the man improved very much and was able to return to his duty.

Cyprus.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused seven admissions, one was due to a mild attack of sunstroke, and two to mental affections, the remaining cases were trivial. Among 13 admissions for *affections of the eyes* were five cases of ophthalmia, which came with the Guards; they were at once isolated, and the disease did not spread. Four admissions for *diseases of the circulatory system* are returned, one of which was due to valve disease of the heart; there were two deaths out of hospital, both caused by aneurism of the aorta. *Respiratory affections* caused 26 admissions, equal to 30·5 per 1,000, which is above the average rate. With the exception of one case of pneumonia and one of pleurisy, all the cases were bronchial affections.

*Diseases of the Digestive System* caused 160 admissions and one death, the admission rate, 187·8 per 1,000, is above the average rate by 50·6, and above the corresponding rate in the previous year by 107·0 per 1,000. The principal causes of admission were tonsillitis, dysentery, diarrhœa, and jaundice. The cases of tonsillitis, 21 in number, were due to cold, and are said to have been of a mild type. Most of the 25 cases of dysentery, it is stated, occurred in the Brigade of Guards, and one or two in the Shropshire Light Infantry from Suakin. Some of the cases were of a very serious nature and one proved fatal. Of 27 cases of diarrhœa, 24 occurred at Troodos, but they were mostly mild in character. 50 cases of jaundice are returned; these occurred more especially among the men from Egypt. It is stated that the disease affected officers and men alike, and some of the cases were of long duration and difficult to treat. The cases were doubtless the result of the rapid and exhausting campaign through which the men had passed.

Among *urinary affections* gonorrhœa and its sequelæ caused an admission rate of 57·5 per 1,000, which is a good deal below the average as well as the corresponding rate in the preceding year. *Cutaneous affections* were more prevalent than in the previous year, but were equal to the average ratio of the preceding six years, the ratio of prevalence being 63·4 per 1,000.

Under the head of *debility*, 53 cases were returned, equal to a ratio of 62·2 per 1,000. It is remarked that "all these cases were the result of privation and hard work in the field, and were exclusively confined to men of the Guards and Shropshire Light Infantry. Some of the cases required great care and continuous nursing, as the men were in a very anæmic and exhausted state."

*Poisons* caused 5 admissions, all being cases of alcoholic poisoning; no death occurred.

There were 68 admissions for *injuries*, equal to a ratio of 79·8 per 1,000; the cases were chiefly contusions, wounds, and sprains, and not of a serious nature.

**Invaliding.**—Seven men were invalided home during the year and 5 were finally discharged, being in the ratios of 8·21 and 5·87 per 1,000 respectively, both showing a considerable decrease when compared with corresponding ratios for the preceding year, and with similar average ratios for the preceding six years. The diseases caused invaliding were mental affections 2 cases, and enteric fever, paralysis, valve disease of heart, cirrhosis of liver, and debility, one case respectively. The disabilities necessitating final discharge were affections of the nervous system in four instances, and hepatic disease in one instance.

**Officers.**—The average strength was 37, and there were 14 attacks of illness. Three of the cases were due to febrile diseases, three to hepatic affec-

*Cyprus.*

tions, and the remainder were single cases of various disorders. No death occurred, but one officer was invalidated on account of hepatitis.

*Women.*—In an average strength of 27 women there were 42 attacks of illness, but no deaths. The rate of prevalence of sickness was 1555·5 per 1,000. Among the admissions were 9 of simple continued fevers, 7 ague, 1 puerperal fever, and 9 of affections of the generative system.

*Children.*—The average strength was 40, and 31 attacks of illness are recorded, equal to a sick rate of 775·0 per 1,000. No death occurred. Two cases of enteric fever are recorded, one contracted at Troodos and the other at Limassol. Among the remainder of the cases were 10 of other fevers, and three each of bronchitis and diarrhœa.

*Sanitary Conditions.*—The Senior Medical Officer states that "the sanitary condition of the camps and quarters, as regards lighting, warming, and drainage, is highly satisfactory, with the exception of the ablution room and the want of a latrine for native drivers at Dépôt Limassol, but provision is made in the estimates for the current year for two new ablution rooms and improved latrine arrangements. The superficial drainage which had been complained of was also to be attended to.

"The water supply is good and abundant at all stations. At Troodos the water runs through iron pipes into the chatties, which is a great improvement on the practice which formerly existed of dipping the chatty into the water, which it invariably fouled.

"The Indian double poled tent in use this year at Troodos was found much more comfortable than the pal tent. The canteen supplies were good, with the exception occasionally of the beer at Troodos."

The medical officer who was in charge at Troodos during the summer advises the selection of a new site for a camp for the troops in the hot season, on account of the number of cases of enteric fever that occurred during the past year, the position of the cemetery with regard to the camp, and because the water sources are at a lower level than the present site, and therefore likely to be fouled by the drainage from the camp.

The Senior Medical Officer states that the health of the troops was excellent previous to going to Troodos, but after their return in October ague was prevalent.

Among the sanitary improvements effected during the year may be mentioned the following: At Polymedia the provision of a cook-house for prisoners, a kitchen for sergeant's mess, magazine, and shed for fire engine; also a stone building for infectious cases, intended for four patients, who are provided with 1,000 feet of cubic space and 100 feet of superficial area each. At Nicosia, also, a new kitchen has been provided.

---

#### IV.—ON THE HEALTH OF THE TROOPS SERVING IN THE DOMINION OF CANADA.

##### *Sickness and Mortality.*

The average strength of the troops quartered in Halifax, which is the only station occupied by imperial troops, was 1,273 warrant officers, non-commissioned officers and men. The garrison was composed of three batteries Royal Artillery, one company and a detachment Royal Engineers, the 2nd Battalion Royal Irish Rifles, detachments of Departmental Corps and Garrison Staff. In November two batteries of Artillery and the detachment Royal Engineers were relieved by two other batteries Royal Artillery and by another detachment Royal Engineers from Bermuda. Drafts for the different corps arrived in the command in June. *Canada.*

There were 910 admissions into hospital during the year, 10 deaths, and 52·19 men constantly sick. The admission rate, therefore, was 714·8 per 1,000, the death rate 7·86, and the constantly sick rate 41·00 per 1,000. Compared with corresponding rates in the preceding year, a decrease is observed in admission rate equal to 63·9 per 1,000, and one of 9·81 in the rate of constantly sick; the mortality rate, however, has increased by 1·54 per 1,000.

In comparison with similar average rates for the preceding 10 years there is a decrease of 5·9 per 1,000 in admission ratio, while the ratios of mortality and constant inefficiency through sickness have increased by 2·17 and 3·63 per 1,000 respectively.

The average sick time to each soldier was 14·96 days, and the average duration of each case of sickness 20·93 days, being shorter than the corresponding periods in the preceding year by 3·63 and 2·95 days, but longer than those of the decennial average by 1·32 and 2·00 days respectively.

In Abstract XLII. will be found the more important of the health statistics relating to the different corps. The highest ratio of admission occurred in the Royal Irish Rifles, 815·7 per 1,000, followed by 668·7 in the Artillery, and 374·0 in the Engineers. The highest ratio of constant inefficiency, 52·89 per 1,000, was also in the Royal Irish Rifles, followed by those of the Artillery and Engineers. Compared with the return for the previous year, these ratios have declined in all the above-named corps. Six of the deaths occurred in the Royal Irish Rifles, one in the Artillery, and three in the Engineers.

The admissions, deaths, &c. in the different classes and orders of diseases are shown in Abstract V.

**GENERAL DISEASES.—Febrile Group.**—There were only 12 admissions, equal to a ratio of 9·4 per 1,000, as compared with 19·8 per 1,000 in the previous year, and with 61·5 per 1,000, the average rate for the preceding six years.

*Eruptive fevers* were represented by a single case of measles, and *continued fevers* comprised two cases of simple continued fever, five of febricula, and one of enteric fever. The latter case proved fatal; it occurred in a man who concealed his illness for a fortnight while he was at musketry. He was eventually admitted to hospital in a state of great general debility, and died 17 days after admission. One case of diphtheria was admitted, but recovered. The Principal Medical Officer, Deputy Surgeon-General W. Cattell, states that this disease is very frequent in the north end of Halifax, where the sewers are old, bad, and irregular. The disease occasionally appears also in the south end. Though the disease is so prevalent in the town it is said that it seldom enters the barracks, owing chiefly to the efficient manner in which their drainage is isolated from the city by a proper system of trapping and ventilation. Two cases of erysipelas complete the admissions for febrile affections.

Canada.

*Constitutional Group.*—228 admissions are included under this head, the ratio per 1,000 of strength being 179·1, which differs very slightly from the average or from last year's rate, there being only an increase of ·6 per 1,000 as compared with the former, and one of 2·0 per 1,000 with the latter. *Rheumatism*, however, was less prevalent than in the preceding year, the admission rate, 40·8 per 1,000, having declined by 20·9; 26, or one half of the cases, are returned as acute rheumatism. The admissions principally occurred in the earlier months of the year. *Primary syphilis* caused 93 admissions and secondary syphilis 63, being in the ratios of 73·1 and 52·6 per 1,000. Compared with the return for the preceding year the rate of admission for primary syphilis has declined by 6·7, and compared with the average rate by 7·1 per 1,000. The ratio of admission for secondary syphilis has increased in both these comparisons, in the former by 24·1, and in the latter by 10·2 per 1,000. Including gonorrhoea and its sequelæ the admission rate for all forms of venereal disease was 226·2 per 1,000, and the number of men constantly inefficient on account of these affections 15·22 per 1,000. These ratios are lower than in the preceding year by 13·3 and 1·38 per 1,000, but higher than the average rates by 3·8 and ·28 per 1,000 respectively. Over one third of the constant inefficiency on account of sickness was due to venereal affections. *Tubercular diseases* caused 16 admissions, equal to 12·6 per 1,000, which is double the rate in the preceding year. Seven of the cases are returned as phthisis pulmonalis and nine as tubercular hæmoptysis. One case of the former proved fatal.

*LOCAL DISEASES.*—*Diseases of the Nervous System* caused 17 admissions, equal to a ratio of 13·4, which is higher than last year's rate and also above the average. Four of the admissions were due to mental affections, and the remainder either to epilepsy or vertigo. *Ophthalmic affections* caused 15 admissions, 7 being for conjunctivitis.

There were 10 admissions for *affections of the circulatory system*. The ratio of prevalence, 7·9 per 1,000, is only half the average rate, and is below that in the preceding year. Eight of the cases were palpitation, one was valve disease of the heart, and one dilatation of the aorta.

*Diseases of the Respiratory System* caused 89 admissions and 4 deaths, being in the ratios of 69·9 and 3·14 per 1,000 respectively as compared with 61·7 and ·79 per 1,000 in the preceding year, which are also very close to average rates. The cases comprised 54 of bronchial affections, 24 of pneumonia, 5 of laryngitis, 4 of pleurisy, and 2 of asthma. Three of the deaths are returned as pneumonia and one as congestion of the lungs. Respiratory affections generally are most prevalent in the early months of the year, and the severe cases of pneumonia occur at that time.

*Diseases of the Digestive System* caused 122 admissions; the ratio of prevalence, 95·8 per 1,000, is below the average by 15·3, and below the rate in the previous year by 17·8 per 1,000. Among the cases were 34 of follicular tonsillitis, which occurred principally in winter, and were due to sudden changes of temperature; dyspepsia caused 26 admissions, a good many due to alcoholic indulgence; 15 cases of jaundice are recorded; they occurred chiefly in late autumn, and originated, it is believed, through chill. One death occurred from acute atrophy of the liver.

Among *Diseases of the Urinary System* the admissions for gonorrhoea and its sequelæ were at the rate of 100·5 per 1,000, which, though below the rate in 1881 by 30·5, is still fractionally above the average rate. Other urinary affections caused a ratio of 18·9 per 1,000, nearly twice that in the preceding year, but with the exception of a case of Bright's disease and one of stricture of the urethra, the cases were not important. Affections of the *cellular tissue* show an increase of prevalence, and *cutaneous diseases* a decrease, the most frequent causes of admission among the latter were ulcers and eczema.

Twelve admissions are shown under the head of *debility*, and 10 under *poisons*. Of the latter, 6 were alcoholic poisoning, 3 delirium tremens, and one a case of poisoning by carbolic acid, which proved fatal. A solution of the poison was swallowed by mistake for beer.

*Injuries* of a local character caused 110 admissions, being rather more numerous than in the preceding year. The principal injuries causing admission were wounds, contusions, and sprains, and many of these, in the opinion of the Principal Medical Officer, were indirectly due to intemperance. There

were two deaths, one accidental, a gunner having fallen from a verandah whilst drunk, and fractured his skull and facial bones; the other suicidal, a man having shot himself through the head while on sentry. It is presumed that the motive for the act was depression of mind at not being able to carry out a plan he had formed to desert. The verdict of the coroner's jury was "temporary insanity."

*Invaliding.*—39 men were invalided during the year, of whom 5 remained in Canada, and the rest were sent to England. The ratio of those sent home was 26·71 per 1,000, which is above the average by 2·72, and above the rate in the preceding year by 6·16 per 1,000. The ratio of final discharge, 27·50 per 1,000, is higher than in 1884 by 6·95, and above the decennial average rate by 10·44 per 1,000. Among the causes of invaliding were respiratory diseases 9 cases, debility 6, mental affections 4, and phthisis pulmonalis, 3 cases. 35 men were finally discharged, and the disabilities necessitating it were principally affections of the nervous and respiratory systems, 8 and 7 cases respectively, phthisis pulmonalis 5, rheumatism 3, and aural diseases 3 cases.

*Officers.*—The average strength was 66, and the number of attacks of illness 24, being equal to a ratio of 363·6 per 1,000 as compared with 280·0 per 1,000 in the preceding year. No death occurred, and no officer was invalided. Among the cases treated were 8 of affections of the throat and tonsils, and 4 accidents; one of the latter, a wound of foot by a splinter, caused a good deal of trouble, and involved operations to remove diseased bone.

*Women.*—In an average strength of 89 women, there were 40 attacks of illness and 2 deaths, being in the ratios of 449·4 and 22·47 per 1,000 respectively, the former showing a decrease, and the latter an increase as compared with the corresponding ratios in the preceding year. Among the cases treated were 16 of debility, 3 of phthisis pulmonalis, 2 of which terminated fatally, 3 of rheumatic affections, 1 of puerperal fever, &c.

*Children.*—The average strength of children was 183; there were 53 attacks of illness and 11 deaths, the rate of prevalence of sickness was 289·6 and that of mortality 60·11 per 1,000, the former showing a decrease and the latter an increase as compared with the previous year. Respiratory affections were the most prevalent diseases, about half the cases being due to them. There were also four cases of diphtheria, four of whooping cough, and six of diarrhoea. The deaths were caused by bronchitis in four cases, diarrhoea in three, and by diphtheria, meningitis, convulsions, and whooping cough in one case respectively.

*Sanitary Conditions.*—The Principal Medical Officer remarks that the condition of the military quarters contrasts very favorably with that of their surroundings, and that the general health of the troops was not injuriously affected by any insanitary condition.

It is reported that the barracks occupied by the troops have been maintained in a good state of sanitation, and that no defects apart from those due to faults of construction have been brought to notice.

The ventilation of the barracks is sufficient, the water supply good and abundant, and ablution accommodation as a rule satisfactory. Increased supply of hot water, without which it is impossible to wash in winter, has been given in all ablution rooms, and is a very necessary comfort.

The rations have been good and sufficiently varied; mutton is issued twice weekly, and there is no lack of vegetables. The cooking arrangements are reported to be satisfactory.

The clothing is of the usual kind, and is adapted to the climate, but in consequence of changes and variations of temperature which occur, the wearing of great coats and furs is generally left to the discretion of commanding officers. Beards are now worn by the troops in winter with salutary effect.

It is stated that the heating of the hospital is unsatisfactory, although the winter was unusually mild, and the advisability of introducing, in any future construction, hot-water heating apparatus is put forward. The use of steam in hospital washing is suggested as a sanitary measure, and also because it would involve less wear and tear in the process.

Wards for the treatment of infectious cases among women and children are urgently needed, as that now appropriated to this purpose cannot be used in winter, and is, besides, inconvenient on account of its size.

The chief alterations and improvements made during the year were the following:—At Wellington barracks the surface drainage has been renewed



*Canada.*

and repaired, and the entire barracks painted and improved. At the Citadel the ablution room has been altered and the bath rooms renewed. The latrine arrangements have been altered to the dry earth system, and this has also been carried out at Forts Ogilvie, Cambridge, and Clarence.

The Principal Medical Officer remarks that "the reliefs arrived in the beginning of November from Bermuda, but it would seem advisable that this service should be carried out somewhat earlier in the year, so that more time might be given in which suitable clothing could be issued, and in which the men would gain slight experience in adapting themselves to the novel conditions of a rigorous and suddenly variable climate at the onset of winter."

---

## V.—ON THE HEALTH OF THE TROOPS SERVING IN BERMUDA.

### *Sickness and Mortality.*

The average strength of warrant officers, non-commissioned officers and *Bermuda*. men serving in Bermuda was 1,385. The composition of the garrison was as follows:—Two batteries of Royal Artillery, two companies Royal Engineers, the 2nd Battalion York and Lancaster Regiment, detachments of Departmental Corps, and Garrison Staff. In November the batteries of Artillery were relieved by others from Gibraltar, and the 30th Company Royal Engineers left for England.

The admissions into hospital during the year numbered 684, there were 18 deaths, and the average number of men constantly sick was 38·83. The ratio of admission was 493·9 per 1,000, that of mortality, 13·00, and that of constant inefficiency through sickness 28·04 per 1,000. Compared with the corresponding rates for the preceding year, there is a considerable decrease in the rate of admission amounting to 123·7 per 1,000, and there is also a decline of 4·36 per 1,000 in the constantly sick rate; but the rate of mortality, which in the previous year was a good deal above the average owing to deaths from enteric fever, has still further increased in the year under report, and principally from the same cause. In comparison with average similar rates for the preceding 10 years, the ratios of admission and constantly sick have declined by 141·6 and 6·41 per 1,000 respectively, while the mortality rate has increased by 5·48 per 1,000.

The average sick time to each soldier was 10·23 days, and the average duration of each case of sickness 20·72 days, the former being shorter than the corresponding period in the previous year by 1·62, while the latter was longer by 1·53 days. In comparison with decennial average periods also, the sick time to each soldier was shorter, but the duration of each case of sickness was increased.

The principal health statistics of the corps which served in the garrison during the year will be found in Abstract XLII. The highest admission rate, 637·8 per 1,000, occurred in the Royal Engineers, followed by the Royal Artillery with 522·0 per 1,000; the admission rate of the York and Lancaster Regiment, which in the preceding year had been equal to 676·5 per 1,000, fell to 473·3 per 1,000; and the ratio of admission of the Garrison Staff and Departments was only 284·1 as compared with 373·5 per 1,000. Four deaths in a small average strength cause the highest mortality rate to be found in the Garrison Staff and Departments, 45·46 per 1,000, followed by the Royal Engineers, 27·03 per 1,000, due to five deaths from enteric fever; the infantry regiment had the lowest death rate, 6·68 per 1,000. The ratio of constantly sick was highest in the Artillery, 34·88 per 1,000, and lowest in the Departments, 17·61 per 1,000.

The admissions, deaths, invaliding, &c. in the various classes and orders of diseases are shown in Abstract No. VI.

**GENERAL DISEASES.**—57 admissions and 10 deaths from *diseases of the febrile group* give ratios per 1,000 of strength of 41·1 and 7·22 respectively as compared with 71·5 and 6·45 per 1,000 in the preceding year, and with average similar ratios for the preceding six years of 49·6 and 2·71 per 1,000.

*Enteric Fever* caused 29 admissions and 10 deaths, being in the ratios of 20·9 and 7·22 per 1,000 of strength as compared with 40·0 and 6·45 per 1,000 in the previous year. The rate of mortality to attacks was over 34 per cent., being more than twice as great as in 1884, but this is owing in great measure to the

*Bermuda.*

occurrence of 3 deaths in cases admitted in that year. 27 of the admissions took place at Prospect, and one at Watford and St. George's respectively. With regard to the causation of the disease, the Principal Medical Officer, Deputy Surgeon-General C. Graves Irwin, M.B., states that "in almost every case of enteric fever the origin of the disease was distinctly traced to causes, milk supply, aerated drinks, and impure water furnished from outside military precincts;" while the medical officer in charge at Prospect, where nearly all the cases occurred, states that, as the sanitary condition of Prospect Camp is very good, "the cause of the recent outbreak of enteric fever must be looked for without the camp, and sufficient evidence can be brought forward to produce a strong suspicion that the general insanitary state of the town of Hamilton is the cause, under favourable meteorological conditions." He states also that recommendations have been made to improve the drainage of Prospect Camp with a view to reduce these annual fevers, but he thinks that success would not be obtained unless efforts in this direction were also made with regard to the drainage of the town of Hamilton. *Other continued fevers* caused 28 admissions, equal to 20·2 per 1,000 of strength, which is only about two thirds of the corresponding rate in the previous year, and also of the corresponding average rate in the previous six years. 25 of the cases are returned as febricula, and only 3 as simple continued fever. *Paroxysmal fevers* caused no admissions, nor did any case occur of *other diseases* of the febrile group.

The *constitutional group* of diseases caused 120 admissions and 3 deaths, being in the respective ratios of 86·6 and 2·17 per 1,000, as compared with 100·6 and ·64 in the previous year, and with average rates of 87·9 and 1·21 per 1,000. *Rheumatic affections* caused an admission rate of 24·6 per 1,000, being considerably below the rate in the previous year and also below the average. The cases included 3 of the acute form, but there was no death. *Primary syphilis* caused 36 admissions, equal to 26·0 per 1,000, below the previous year's rate by 7·5, and below the average rate by 13·4 per 1,000; but *secondary syphilis* caused 37 admissions, or 26·7 per 1,000, which is higher than the rate in the foregoing year by a fraction, and than the average rate by 13·8 per 1,000. The admission rate for all forms of venereal disease, including gonorrhœa and its sequelæ, was 67·2 per 1,000, which compares favorably with an average rate of 79·4, and the previous year's rate of 84·4 per 1,000. The rate of constant inefficiency from these affections was 4·10 per 1,000, being below the rate in 1884, as well as below the average. *Tubercular diseases* were the cause of 11 admissions, 10 were cases of phthisis pulmonalis, of which 3 proved fatal. With regard to this affection the Principal Medical Officer remarks that "phthisis does not seem indigenous to Bermuda, but if the disease is either inherited or imported, it develops with singular rapidity." Two admissions for *other diseases* of this group were due to lupus.

**LOCAL DISEASES.**—8 admissions and 1 death are recorded for *diseases of the nervous system*. Among the cases were 3 of paralysis, and 2 of sunstroke, one of which proved fatal.

*Diseases of the Circulatory System* caused 10 admissions, 5 for cardiac disease and 5 for affections of the veins.

*Diseases of the Respiratory System* caused 46 admissions, 8 for pneumonia, 2 for pleurisy, 1 for laryngitis, 1 for emphysema, and the remainder for bronchial affections. 136 admissions are recorded for *diseases of the digestive system*, equal to a ratio of 98·2 per 1,000, which is a good deal below the average rate, as well as that of the preceding year. The principal diseases were tonsillitis, dyspepsia, diarrhœa, and colic; among others causing admission were dysentery 2 cases, hernia 4, and hepatitis 6, of which 1 was fatal; there was also a death out of hospital from yellow atrophy of the liver. The Principal Medical Officer remarks that this case "occurred in the person of a warrant officer residing in a house privately rented, the immediate surroundings of which were in a highly insanitary condition."

The admission rate for *diseases of the urinary system* was 20·3 per 1,000, of which 14·5 was accounted for by gonorrhœa and its sequelæ, which rate, however, is a good deal below the average as well as below the previous year's rate.

*Diseases of the cellular tissue and cutaneous system* caused decreased admission rates as compared with those of the preceding year, particularly marked in the case of cutaneous affections.

The number of admissions for *debility*, 26, is higher than usual; while that for *poisons* is the same as in the preceding year, the cases were due to poisoning by nicotine in one case, to delirium tremens in three, and to alcoholic poisoning in 12 cases. No death occurred.

*Injuries* caused 113 admissions, 6 being for burns and scalds, 27 for contusion, 5 for fracture, 41 for wounds, 27 for sprains, 2 for dislocation, and 5 for blistered feet. Two deaths occurred, one of which is returned as contusion of the abdomen, resulting from a fall, the other was due to gunshot wound of the head, self-inflicted; the motive for the suicide was believed to be domestic trouble.

*Invaliding.*—The number of men invalided home during the year was 33, equal to 23·83 per 1,000 of the strength, which rate is above the decennial average by 6·46. The number is increased owing to there having been no invaliding in the previous year, transport not having been available. The principal causes of invaliding were phthisis pulmonalis 8 cases, diseases of the digestive system 6 cases (including 3 of hernia), debility 5 cases, rheumatism 3 cases, and nervous affections 3 cases. 8 invalids were finally discharged the service, the ratio per 1,000 of strength, 5·77 per 1,000, being higher than in the preceding year, but still a good deal below the corresponding average rate for the preceding decennial period. The disabilities necessitating discharge were debility 4 cases, phthisis pulmonalis 2, and lupus and chorea 1 case respectively.

*Officers.*—The average strength of officers was 63, among them there were 17 attacks of illness, but no death. The rate of prevalence of sickness was 269·8 per 1,000, higher by 63·4 than in the previous year. Among the cases treated were three of enteric fever and two of hepatic disease. One officer was invalided on account of cirrhosis of the liver.

*Women.*—In an average strength of 96 there were 28 cases of sickness, equal to a ratio of 291·7 per 1,000, and one death, equal to 10·42 per 1,000. Both these rates show a considerable reduction on those of the preceding year. 13 of the cases are returned as debility, under which head also the fatal case is recorded. One case of enteric fever is shown, but the remainder of the attacks of illness call for no remark.

*Children.*—The average strength of children is returned as 175. Among these there were 53 attacks of illness and 6 deaths, being in the respective ratios of 302·9 and 34·29 per 1,000, which compare favorably with similar rates in 1884. Febrile diseases (including 3 cases of enteric fever and 2 of diphtheria), bronchial affections, and diarrhoea were the principal illnesses. The deaths were due to diarrhoea in two instances, and to phthisis pulmonalis, premature birth, debility and fracture one case respectively.

*Sanitary Conditions.*—The Principal Medical Officer remarks in his annual report that “the position of the islands, about midway between the northern edge of the N.E. trade wind and the south-west margin of the Gulf Stream, both uncertain in their outline, ensure for Bermuda a climate delightfully varied within a moderate range, and an immunity from stillness of the atmosphere, During the summer months south-west winds prevail, while north-west blow from November to April. The extreme of cold is usually reached in the month of March, about 40°, and the maximum of heat in August, about 87°. The rainfall is pretty evenly distributed over the year, giving an average of about 50 inches.

“There are no springs in the island, but a few wells are sunk here and there, and fed by drainage from higher levels; their supply, however, is precarious and more or less brackish at high tides. Rain water, collected on roofs and catches and stored in tanks, forms the principal source of water for use. These tanks, under military supervision, are carefully guarded from contamination and are periodically emptied and cleaned, whereas among the civil population there exists a great want of care in this direction.

“The general insanitary condition of civil surroundings has been brought to the notice of the military authorities with a view of impressing the matter on the municipal bodies.

“In consequence of representations made, it has been ruled that no civil quarter is to be hired unless it shall have been previously inspected by a medical officer.

*Bermuda.*

“ Particular attention has been paid to the water supply, not only in barracks  
“ but in all hired quarters. Frequent analyses have been made, and tanks have  
“ been emptied, cleaned, and re-cemented whenever necessary. A more effective  
“ supervision of the milk supply has been ensured, and repeated inspections of  
“ aerated drink factories have been made.  
“ The surface drains generally have been channelled and cemented, and  
“ catchpits have also been cemented and grated.”

---

## VI.—ON THE HEALTH OF THE TROOPS SERVING IN THE WEST INDIES.

### *Sickness and Mortality.*

#### I.—WHITE TROOPS.

The average strength of warrant officers, non-commissioned officers and men was 900. The force in the Command was composed as follows :—The 6th battery, 1st Brigade, Cinque Ports Division, Royal Artillery, at Barbados, from 1st January to 9th December, when it was relieved by No. 6 battery, London Division; the 6th battery, 1st Brigade, Welsh Division, Royal Artillery, relieved at Jamaica in December by the 3rd battery, Welsh Division; the 1st Battalion North Staffordshire Regiment; detachments Royal Engineers and Garrison Staff. *West Indies Command.*

The number of admissions into hospital was 830, there were 7 deaths, and the average number constantly sick was 38·77. The ratio of admission was therefore 922·2 per 1,000, that of deaths 7·77, and that of constantly sick 43·08 per 1,000. Compared with the corresponding rates in the preceding year, there is an increase of 172·7 per 1,000 in admission rate, and one of 3·24 in constantly sick rate, but the mortality rate has declined by 3·56 per 1,000; and compared with decennial average rates the admission rate is increased by 33·7 per 1,000, while the death rate and the rate of constant inefficiency through sickness are lower by 7·59 and 1·46 per 1,000 respectively. The average sick time to each soldier was 15·72 days, and the average duration of each case of sickness 17·05 days, the former being longer than the corresponding period in the previous year by 1·14 days, and the latter shorter by 2·41 days, while both are shorter than average periods in the preceding 10 years.

The more important of the health statistics of the different corps which served in the Command will be found in Abstract XLII.

Excluding the batteries of artillery which arrived in the Command in the last month of the year, the highest annual admission rate, 1036·7 per 1,000, is found in the 6th battery, 1st Brigade, Welsh Division, Royal Artillery, followed by 985·3 per 1,000 in the North Staffordshire Regiment. Two deaths occurred in each of the above-mentioned corps, single deaths in other two artillery batteries, and one death in the 1st West India Regiment. The highest rate of constant inefficiency through sickness was 49·62 per 1,000 in the North Staffordshire Regiment. The stations occupied by European troops were Barbados, Jamaica, and Trinidad, a few men only being in the Bahamas, Honduras, and Demerara.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract No. VII.

**GENERAL DISEASES.**—*Febrile Group.*—Under this head 120 admissions and 4 deaths are returned, being in the ratios of 133·3 and 4·44 per 1,000 respectively, as compared with 55·6 and *nil* in the preceding year, a considerable increase being observed in both, but still they compare favourably with the average ratios for the preceding six years, which amount to 196·0 and 12·46 per 1,000. The ratio of constant inefficiency for fevers, 4·35 per 1,000, though nearly twice that in the previous year, is below the average rate by 2·87 per 1,000.

*Eruptive Fevers* were represented by one case of measles, which occurred at Barbados.

*Enteric Fever* caused three admissions and two deaths; two of the cases occurred in Jamaica, one being fatal; the remaining case occurred in Barbados, and was fatal. *Other continued fevers* caused 86 admissions, equal to

*West Indies  
Command.*

95·6 per 1,000, being twice as prevalent as in the preceding year, but below the average; 46 of the cases occurred in Barbados, 36 in Trinidad, and 4 in Jamaica. Yellow fever was the cause of 5 admissions and 2 deaths. All the cases occurred in Jamaica, 4 with 2 deaths at Port Royal, and the other at Newcastle. The medical officer in charge at Port Royal states that the disease was "epidemic in the last quarter of 1885. The first death from the disease" in the locality occurred on the 9th October in the person of a sailor. A few weeks then elapsed, and on the 3rd November a child in garrison was attacked and died on the 7th. In this case there was no trace to be found of contagion, but the patient communicated the disease to a younger sister. Next two boys were attacked on the 13th and died on the 16th, and on the 17th an artilleryman was attacked, and the garrison was evacuated that day. Another man from the same ward was also attacked. Both these cases showed extreme malignancy, and both men died, one after two days' illness and the other after six. Next the two attendants on the sick men were attacked, one case being very severe, the other much milder; both of these recovered." The garrison was removed to a camp of isolation at Papine, and no fresh cases occurred there. The remaining case of yellow fever occurred at Newcastle, but it is stated that it was not contracted at that station.

*Paroxysmal Fevers* caused 25 admissions, equal to 27·8 per 1,000, a good deal below the average rate, though much above the rate in the preceding year. Of the cases 13 were ague, and 12 remittent fevers of which 10 of the former and 9 of the latter occurred in Jamaica.

*Constitutional Group.*—The admissions numbered 134, equal to a rate of 148·9 per 1,000, which is in excess of the average ratio for the preceding six years by 36·8 and of the previous year's ratio by 15·9 per 1,000. *Rheumatism* was less prevalent than in the preceding year, the ratio of admission, 23·3 per 1,000, having declined by 5·6. Among the 21 cases there was only one of acute rheumatism.

The admissions for *primary syphilis* numbered 59, and for secondary syphilis 47, being equal to ratios of 65·5 and 52·2 per 1,000 respectively. The ratio of admission for primary disease compares favourably with that in the preceding year, 75·3 per 1,000, but is above the average ratio of six years by 14·3 per 1,000. The ratio for secondary affection is high, exceeding that in the previous year by 31·6 and the average rate by 36·9 per 1,000. Including gonorrhœa and its sequelæ, the admission rate for all forms of venereal disease amounted to 226·7 per 1,000, being higher than the rate in the preceding year by 47·3 and than the average rate by 86·4 per 1,000. The rate of constant inefficiency from these affections was 14·44 per 1,000, which is fractionally greater than in the previous year and above the average by 5·38 per 1,000.

Seven admissions are returned for *phthisis pulmonalis*; five of the cases occurred at Barbados and one at Jamaica and Trinidad respectively. There was one death at Barbados, an invalid from Trinidad.

**LOCAL DISEASES.**—*Nervous affections* caused 15 admissions and 2 deaths. The rate of prevalence, 16·7 per 1,000, though higher than in the previous year by 6·4, is only fractionally above the average. The cases comprised 5 of epilepsy, 3 of mental affection, 3 of neuralgia, 2 of paralysis, and 1 of apoplexy and sunstroke respectively. Two deaths resulted from apoplexy. 21 admissions are shown for *diseases of the circulatory system*; of these, 17 were due to palpitation, 2 to valve disease, and 2 to varicose veins. The ratio of prevalence, 23·3 per 1,000, is above the average rate.

*Respiratory Diseases* caused 19 admissions, one case of pneumonia, pleurisy, and asthma respectively, and the remainder bronchial affections. The rate of prevalence, 21·1 per 1,000, is greater than in the preceding year.

*Diseases of the Digestive System* caused an admission rate of 112·2 per 1,000, which is higher than the previous year's rate by 12·2, but lower than the average rate by 7·5 per 1,000. The principal causes of admission were tonsillitis, dyspepsia, and diarrhœa, three fourths of the total number of cases being due to these affections.

Among urinary diseases the admission rate for gonorrhœa and its sequelæ, 108·9 per 1,000, exceeds that in the preceding year by 25·4 and the average rate by 35·2 per 1,000. *Cutaneous affections* caused 81 admissions, the rate of pre-

valence, 90·0 per 1,000, is greater than in the previous year, and is above the average. The remaining orders of this class of diseases require no special mention. *West Indies Command*

*Debility* caused 19 admissions, and *poisons* 7 admissions; of the latter six were due to the abuse of alcohol, and one to poisoning by hydrochloric acid. In the latter case a man drank a small quantity of the acid from a bottle by mistake, but soon recovered.

*Injuries*.—122 admissions for local injury are recorded, the ratio of prevalence, 135·6 per 1,000, being above the average. The admissions were due to contusions, 45 cases; wounds, 52; sprains, 20; dislocations, 4; and fractures, one case. Two minor operations are recorded.

*Invaliding*.—17 men were invalided home during the year, and 6 were finally discharged the service, being in the ratios of 18·88 and 6·66 per 1,000 respectively. Compared with corresponding rates in the previous year there is a decrease of 8·95 per 1,000 in the former and one of 6·73 in the latter, and compared with decennial average rates a decrease also is observed in both, being 7·94 and 8·80 per 1,000 respectively. The causes of invaliding were phthisis pulmonalis, 4 cases; heart disease, 2; mental disease, 2; debility, 4; and epilepsy, secondary syphilis, aural disease, goitre, and bronchitis, one case respectively. The disabilities necessitating final discharge were secondary syphilis, epilepsy, mania, bronchitis, cystitis, and debility, one case respectively.

*Officers*.—The average strength during the year was 101, and the number of attacks of illness 74; there was one death, and two officers were invalided home. The ratio of sickness to strength, 732·7 per 1,000, is higher by 285·4 than that in the previous year, but the ratios of mortality and invaliding, 9·90 and 19·80 per 1,000, have declined by 7·60 and 24·10 per 1,000 respectively. The principal illnesses were fevers, and disorders of the digestive system. The former comprised one case of enteric fever, 15 of other continued fevers, 5 of remittent fever, 1 of ague, and 2 of yellow fever, one of which proved fatal. The latter were chiefly diarrhoea and dyspepsia, and there were 3 cases of hepatic affections. The causes of invaliding were yellow fever and angina pectoris respectively.

*Women*.—In an average strength of 100 there were 33 attacks of illness and one death. The sick rate, 330·0 per 1,000, was higher than in the preceding year by 58·4. Fevers caused 7 admissions, rheumatism 4, digestive disorders 5, affections of the generative system 5, and debility 9. The death is shown as the result of acute rheumatism.

*Children*.—The average strength was 172, and there were 40 attacks of illness and 8 deaths; the ratio of sickness, 232·5 per 1,000, and that of mortality, 46·51 per 1,000, are considerably higher than the corresponding rates in the preceding year. Among the cases treated were 2 of measles, 4 of yellow fever, 10 of ophthalmic affections, 6 of respiratory diseases, and 5 of digestive disorders. The deaths were caused by yellow fever in three cases, and by pneumonia, tonsillitis, ophthalmia neonatorum, diarrhoea, and debility, one case respectively.

*Sanitary Conditions*.—The Principal Medical Officer, Deputy Surgeon-General A. M. Tippetts, reports favourably on the sanitary condition of the quarters at the several stations, and states that the accommodation has been good; there was no overcrowding, and the ventilation was satisfactory. The water supply was generally good and sufficient, and the drainage and conservancy were satisfactory. The rations and supplies were good in quality, the means of cooking ample, and every facility afforded to vary the diet. Preserved meat, mutton, issued once a week at Barbados and Trinidad, and was good and wholesome. The duties and employment have consisted of ordinary drills and parades and were conducive to health. Means of recreation are provided, cricket, quoits, &c. for outdoor, and games, newspapers, &c. for indoor amusement.

The following sanitary improvements were carried out during the year:—At Barbados: at Bush Hill barracks an upper story has been constructed to staff sergeants' quarter; at the Brick barracks a covered way provided from the married soldiers' quarters to the cooking shed, and a dry earth closet provided to staff sergeants' quarters; at the Stone barracks latrine and bath accommodation provided to field officers' quarters; and latrines and urinal provided to men's barracks; also minor improvements at other places.



## II.—BLACK TROOPS.

*West Indies  
Command.*

The average strength of non-commissioned officers and men was 1,186, exclusive of white sergeants. The black troops serving in the Command were the head-quarters of the 1st West India Regiment at Jamaica, with detachments at Nassau, Honduras, and Demerara, being in course of relief towards the end of the year by detachments of 2nd West India Regiment; at Barbados a detachment 2nd West India Regiment, in course of relief by detachment 1st West India Regiment, and the corps of military labourers.

The admissions into hospital numbered 1,166, the deaths 18, and the average number constantly sick 71·41, being in the ratios of 983·1, 15·17, and 60·21, per 1,000 respectively. Compared with corresponding rates in the preceding year there is an increase in that of admission, equal to 57·0 per 1,000, and one of 3·87 per 1,000 in that of mortality, but in the rate of constantly sick there is a fractional decrease.

In comparison with corresponding average rates for the preceding 10 years a decrease of 94·4 per 1,000 is observed in the admission rate, and one of ·43 in the death rate; in the rate of constant inefficiency through sickness, however, an increased of 7·93 is noticed.

The average sick time to each soldier was 21·97 days, and the average duration of each case of sickness 22·35 days, being shorter than the corresponding periods in the preceding year by ·17 days and 1·55 days, but longer than the average periods in the preceding 10 years by ·70 days and 2·61 days respectively.

The ratio of admission in the 1st West India Regiment was 1382·7 per 1,000, being more than twice as great as that in the detachment 2nd West India Regiment. Of the deaths 14 occurred in the former and 3 in the latter regiment; there was also one death in the corps of military labourers.

The admissions, mortality, &c. in the different classes and orders of diseases are shown in Abstract VIII.

**GENERAL DISEASES.—Febrile Group.**—176 admissions are recorded, also one death. The ratio of prevalence, 148·4 per 1,000, is higher than in the preceding year by 26·7, but lower than the average rate of the preceding six years by 56·8 per 1,000. There were four admissions for *eruptive fevers*, two of these were for small-pox at Nassau, the cases were very mild, and occurred at a time when the disease did not exist among the civil population, and their origin could not be traced; the other two admissions were for measles, one at Honduras and one at Demerara. *Continued fevers*, caused 83 admissions, 61 cases of simple continued fever, and 22 of febricula. The great majority of the cases occurred at Jamaica; the rate of admission 70·0 per 1,000, is above the average. The ratio of admission for *paroxysmal fevers*, 56·5 per 1,000, is considerably below the average and slightly below the rate in the previous year. Of the cases 38 are returned as ague, and 29 as remittent fever. 25 cases of remittent fever occurred at Honduras, and 4, one being fatal, at Jamaica. Ague caused most admissions at Jamaica, and there were also cases at Honduras, Demerara, and Nassau. No paroxysmal fever occurred at Barbados. The remaining admissions for febrile diseases were one case of erysipelas and 21 cases of mumps, all the latter occurred in Jamaica.

**Constitutional Group.**—Under this head 280 admissions and 3 deaths are returned; the admission rate, 236·1 per 1,000, is higher than in the preceding year by 17·8, but is almost identical with the average rate. *Rheumatism* caused 55 admissions, 8 being for the acute form; the ratio of admission, 46·4 per 1,000, though below the average, is slightly higher than in the previous year. *Primary syphilis* caused 198 admissions and secondary syphilis 24, the ratios of admission being 167·0 and 20·2 per 1,000 respectively, as compared with 157·4 and 11·3 per 1,000 in the previous year, and with average rates of 129·9 and 25·9 per 1,000. Including gonorrhœa and its sequelæ, the total admission rate for all forms of venereal affections was 346·6 per 1,000, being greater than in the preceding year by 24·8, and than the average rate by 45·7 per 1,000. The ratio of constant inefficiency on account of these affections was 25·29 per 1,000, above the average rate by 3·53 per 1,000, but fractionally lower than the rate in 1884. Three admissions and three deaths

from phthisis pulmonalis are returned, of the latter two occurred at Nassau and one at Jamaica. *West Indies Command.*

**LOCAL DISEASES.**—*Nervous diseases* caused 15 admissions, of which 3 were cases of mental affection. There were also 9 admissions for neuralgia, and one for sunstroke, paralysis, and epilepsy respectively. *Ophthalmic affections* show an increase in prevalence, the ratio of admission being 26·1 per 1,000.

*Diseases of the Circulatory System* only caused 13 admissions, 3 being for valve disease and the remainder for palpitation. Three deaths occurred from valve disease of the heart. *Respiratory diseases* caused an admission rate of 57·3 per 1,000, above the rate in the preceding year by 18·2, and a little above the average. Among 68 admissions there were 52 of bronchial affections, and 12 of pneumonia with 4 deaths.

*Diseases of the Digestive System* caused 97 admissions and 3 deaths. The admission rate, 81·8 per 1,000, is below the average by 9·9, but above the rate in the previous year by 16·6 per 1,000. The most frequent causes of admission were diarrhoea 25 cases, tonsillitis 24, dyspepsia 12, dysentery 12 and hepatic affections 7. Two deaths were due to diarrhoea, and one to cirrhosis of the liver. *Urinary diseases* were almost entirely cases of gonorrhoea and its sequelæ, only 4 admissions out of a total of 193 being for other urinary affections. The admission rate for gonorrhoeal affections was 159·4 per 1,000 as compared with 153·1 in the preceding year, and with an average rate of 145·1 per 1,000. *Cutaneous affections* caused an admission rate of 42·2 per 1,000, which is below the rate in the previous year by 5·6, and is considerably below the average. With regard to the remaining orders of local diseases no great variation of prevalence is observed in any, and the cases do not call for special remark. Eleven admissions are returned under the head of *debility*, and under *poisons* two admissions are shown, one for delirium tremens and one for snake bite; there was also one death from alcoholic poisoning.

*Injuries.*—A death occurred at Jamaica from asphyxia by plugging of the air passages with food while drunk; and at Nassau there was a case of suicide by drowning. A verdict of temporary insanity was returned at the coroner's inquest. 113 admissions on account of local injury are returned, equal to 95·3 per 1,000, a little above the average rate of prevalence. Contusions, wounds, and sprains were the causes of nearly all the admissions.

Among surgical operations may be mentioned one case of removal of fatty tumour, and one of excision of the head and part of the shaft of the fibula on account of necrosis. In both these cases the result was satisfactory.

*Invaliding.*—27 men were invalided and discharged the service, being in the ratio of 22·76 per 1,000 of strength, which is below the ratio in the previous year by 4·20, and below the decennial average rate by 17·44 per 1,000. The principal causes of invaliding were secondary syphilis 2 cases, mental disease 2, ophthalmic affections 4, heart disease 4, respiratory diseases 3, cutaneous affections 2, including one case of elephantiasis, and debility 2 cases.

*Women and Children.*—The average strength of women was 76, and there were 7 cases of sickness, being equal to 92·1 per 1,000. The average strength of children was 84, and there were 7 cases of sickness, being equal to 83·3 per 1,000. Both these rates of sickness show a marked decrease from the corresponding rates in the preceding year. Among the women there was a fatal case of phthisis pulmonalis, and among the children a fatal case of diarrhoea.

*Sanitary Conditions.*—The Principal Medical Officer reports that the black troops occupied the same barracks as hitherto, and that the ventilation and accommodation in them was satisfactory. The hospital buildings and accommodation are also satisfactory. The water supply is reported to be good and sufficient, and the drainage satisfactory. The rations were good and sufficient, the dietary being the same as for white troops; cooking arrangements also satisfactory. The duties and employment were by no means prejudicial to health, and means of recreation, both out and indoor, are provided. At the Eve Leary Barracks in Demerara improvements have been effected in the married soldiers' kitchen and water supplied to the ablution rooms.

## VII.—ON THE HEALTH OF THE TROOPS SERVING IN WESTERN AFRICA.

### *Sickness and Mortality.*

#### I.—WHITE TROOPS.

##### *West Africa.*

The white troops consisted of the European non-commissioned officers of the West India Regiments and of the officers serving in the Command. The average strength of the former was 11; there were 19 admissions into hospital, 2 deaths, and 7 non-commissioned officers were invalided. The rate of prevalence of sickness, 1727·3 per 1,000, has declined considerably from that in the previous year. Of the admissions, eight were due to remittent fever, three to debility, two to enteric fever, and the rest were single instances of various diseases. The deaths were due to enteric fever and pneumonia respectively. Three men were invalided for debility, two for remittent fever, one for enteric fever, and one for splenitis.

The average strength of officers was 25, and the number of attacks of illness 47, being equal to a ratio of 1880·0 per 1,000, which is slightly above the corresponding rate in the preceding year. More than half the cases of sickness were due to fevers, remittent fever alone causing 22 attacks, and there were two cases of enteric fever. Among the other cases were five of diarrhoea, two of hepatitis, and two of dysentery. One death occurred from apoplexy. Ten officers were invalided, five on account of remittent fever, two for enteric fever, two for dysentery, and one for hepatitis.

#### II.—BLACK TROOPS.

The average strength of the black troops during the year was 422, of which 282 were at Sierra Leone, and 140 at Cape Coast Castle. The headquarters 2nd West India Regiment was at the former, and a detachment at the latter place. In September and October three companies of this regiment returned to the West Indies, and two companies of the 1st West India Regiment arrived in relief in December.

The admissions into hospital during the year numbered 553, the deaths 6, and the average constantly sick, 29·13. The ratio of admission per 1,000 was therefore 1310·4, that of mortality, 14·22, and that of constant inefficiency through sickness, 69·03. Compared with the corresponding rates for the preceding year, an increase of 34·0 per 1,000 is observed in the rate of admission, and one of 1·52 in that of constantly sick, but a decrease of 2·47 per 1,000 occurred in the death rate. In comparison with average rates for the preceding decennial period, a decline of 175·4 per 1,000 is noticed in admission rate, and one of 5·06 in mortality rate; the constantly sick rate, however, is increased by 5·87 per 1,000. The average sick time to each soldier was 25·19 days, and the average duration of each case of sickness, 19·23 days, the former being fractionally longer, and the latter similarly shorter than the corresponding period in the preceding year, while comparing them with average periods for the previous 10 years both are longer by 2·14 days and 3·72 days respectively.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract IX.

**GENERAL DISEASES.**—The *febrile group* of diseases caused 112 admissions and one death, being in the ratios of 265·4 and 2·37 per 1,000 respectively, which compare very favorably with the corresponding rates in the preceding year, the decline being equal to 46·3 and 3·20 per 1,000 respectively, and also with the average of the corresponding rates of the previous six years, the decline

of admission rate being equal to 235·4 per 1,000, and that in the mortality to 1·43 per 1,000. The diseases of this group, with the exception of one case of erysipelas, were all *paroxysmal fevers*, 109 cases being returned as remittent fever, and 2 as ague. The rate of prevalence, 263·0 per 1,000 has decreased considerably from the average rate. Of the cases of remittent fever, 66 occurred at Sierra Leone, and the remainder at Cape Coast Castle. The cases were, as a rule, mild, and yielded readily to treatment, but there was one fatal case at Cape Coast Castle.

Under the *constitutional group* of diseases 83 admissions and 3 deaths are returned, equal to 196·7 and 7·11 per 1,000; the rate of prevalence is higher by 7·4 than in the preceding year, but still below the average rate; the rate of mortality also is higher than in the previous year, but is below the average of the preceding six years. *Rheumatism* caused 31 admissions, equal to a ratio of 73·4 per 1,000. *Primary syphilis* caused 41 admissions, and secondary syphilis 4, being in the respective ratios of 97·2 and 9·5 per 1,000, as compared with 66·8 and 42·7 per 1,000 in the previous year, and with 105·7 and 38·7 per 1,000, the average similar rates for the preceding six years. Including gonorrhœa and its sequelæ, the rate of admission for all forms of venereal disease was 227·6 per 1,000, which is lower than the rate in the preceding year by 65·5, and than the average rate by 77·9 per 1,000. The rate of constant inefficiency from these affections was 19·55 per 1,000, rather higher than the last year's rate, and to a greater extent above the average. *Phthisis pulmonalis* caused four admissions, two of which had fatal results. There were three admissions for beri-beri recorded at Sierra Leone, one of which had a fatal termination.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused five admissions, of which two were for mental disease and one for epilepsy.

*Diseases of the Circulatory System* were the cause of 12 admissions, 10 being for palpitation and one for hypertrophy of the heart and angina pectoris respectively. The admissions for *respiratory diseases* numbered 33, of which 25 were bronchial affections; there were also 3 cases of pleurisy, 2 of asthma, 1 of pneumonia, and 2 of laryngitis, one of which proved fatal.

52 admissions for *diseases of the digestive system* caused a rate of prevalence of 123·2 per 1,000, which is below the average rate by 12·5, and the last year's rate by 10·4 per 1,000. Among the cases treated were 21 of dysentery, 10 of *tænia solium*, and 2 of hepatitis. Among *urinary affections*, gonorrhœa and its sequelæ caused an admission rate of 120·9 per 1,000, which is considerably below the average rate as well as that of the previous year. Other diseases of the urinary system were represented by two cases of Bright's disease. The remaining orders of local diseases do not call for remark, except that the admission rate for *cutaneous affections* is high, being 189·6 per 1,000, a good deal above the average rate. Among the admissions were 29 cases of ulcer and 18 of ringworm.

*Debility and poisons* returned one admission respectively; that of the latter was due to alcohol. *Injuries* caused 62 admissions of an ordinary character, contusions, wounds, and sprains being the most frequent.

*Invaliding*.—25 men were invalided to the West Indies during the year, equal to a ratio of 59·25 per 1,000. The principal causes of invaliding were rheumatism, tubercular affections, cardiac disease, Bright's disease, and diseases of the digestive system. 16 men, equal to a ratio of 37·91 per 1,000, were finally discharged during the year as medically unfit for further service. The chief disabilities were debility, affections of the organs of locomotion, diseases of nervous and circulatory systems, &c.

*Women*.—The average strength is recorded as 34, and there were 25 attacks of illness, equal to a ratio of 735·3 per 1,000, which is lower than the similar rate in the previous year by 191·5. Among the cases treated were 9 of remittent fever, from which also there was one death.

*Children*.—11 attacks of illness are returned out of an average strength of 21, being equal to a ratio of 523·8 per 1,000 as compared with 863·6 in the preceding year. Four of the cases treated were due to bronchitis, but only one to remittent fever, 11 having been returned in 1884. No death occurred.

**Sanitary Conditions.**—The Senior Medical Officer, Surgeon-Major J. Macnamara remarks in his annual report, that "Freetown, the capital of Sierra

*West Africa.*

“ Leone, almost surrounds the conical hill (300 feet above sea level) upon which  
“ Tower Hill barracks and station hospital are built. This town has a popu-  
“ lation of 23,000 inhabitants, but as far as the means of preserving the public  
“ health are concerned it remains in the pre-sanitary state of non-ventilated  
“ cesspools. The town is built by the sea in a basin surrounded on all sides  
“ by high hills. The rain water from these hills is carried off by nullahs,  
“ assisted by roadside drains. It can be easily imagined how the lodgment of  
“ water in the subsoil is a fruitful source of malaria, and when the cesspool  
“ air is added to the malarious exhalations, it can be understood why the local  
“ forms of fevers are of the typho-malarial type. No attempt is being made  
“ to remedy this state of things. There is a good fall of ground from the hills  
“ to the sea, with a plentiful water supply, water drainage is therefore indi-  
“ cated. This, with good subsoil drainage, would doubtless render the colony  
“ less unhealthy; the expense would be great, however, as a rocky soil is met  
“ with here and there where the surface is washed away.”

With regard to the Tower Hill barracks at Sierra Leone no change in the construction or ventilation was made, but a schoolroom was under construction. At Kortright Hill, where the rifle range is situated, two huts for the accommodation of one company were almost complete.

At Cape Coast Castle the ventilation of the barracks was improved, but it is stated that the cubic space allowed is too limited. Improvements were being effected in one of the barrack rooms. The station hospital at Sierra Leone is said to be in a fair state of repair, and gave ample accommodation for the sick. The ventilation is good. The means of ablution are deficient, but steps were being taken to improve them.

It is stated that the rations were generally good. Tinned meat is issued to the troops once a week at Sierra Leone and twice at Cape Coast Castle, at which station the medical officer in charge reports that the fresh meat is of poor quality, but that it is the best that can be obtained.

---

# VIII.—ON THE HEALTH OF THE TROOPS SERVING AT THE CAPE OF GOOD HOPE AND AT ST. HELENA.

## *Sickness and Mortality.*

The average strength of the warrant officers, non-commissioned officers, and men serving in the Command during the year was 3,939. The force was composed as follows: the 13th Hussars, six batteries Royal Artillery, detachments Royal Engineers, the 2nd Battalion South Lancashire Regiment, the 1st Battalion Argyll and Sutherland Highlanders, the 1st Battalion the Welsh Regiment, detachments Departmental Corps, and Garrison Staff; these were present throughout the year. The 6th Dragoons were in the Command at the commencement and close of the year, but were absent for about nine months with the Bechuanaland Field Force; the 1st Battalion Royal Scots joined the Command from that force in September, and the 1st Battalion Royal Inniskilling Fusiliers arrived from China in November, having been relieved by the 2nd Battalion Northamptonshire Regiment from this Command.

*Cape of Good Hope and St. Helena.*

The number of admissions into hospital during the year was 3,472, of deaths 35, including that of an invalid after arrival at home, and the average constantly sick was 205·41. The ratio of admission was, therefore, 881·4 per 1,000, that of mortality 8·89, and that of constantly sick 52·14 per 1,000. Compared with the corresponding rates in the previous year an increase of 202·0 per 1,000 is observed in the ratio of admission, one of ·98 in the death rate, and one of 8·04 per 1,000 in the rate of constant inefficiency through sickness. In comparison with average similar ratios for the preceding 10 years the increase in admission rate is 59·1, and in the constantly sick rate 2·04 per 1,000, but the death rate is considerably lower.

The average sick time to each soldier was 19·03 days, and the average duration of each case of sickness 21·59 days, the former being longer by 2·89 days, and the latter shorter by 2·17 days than the corresponding period in the previous year; but compared with the preceding decennial average the sick time to each soldier was only fractionally longer, and the average duration of each case of sickness similarly shorter.

In the island of St. Helena alone in an average strength of 140 there were 46 admissions, 1 death, and 3·06 constantly sick, being in the ratios of 328·6, 7·14, and 21·86 per 1,000 respectively. The ratios of admission and constantly sick compare favourably with those in the preceding year.

The Principal Medical Officer, Deputy Surgeon-General J. G. Faught, states that the general health of the troops in the Command may be said to have been satisfactory, notwithstanding the arrival of troops from Mauritius and Singapore, and the consequent increase in the admissions for ague.

With regard to the health of particular corps the most important of their statistics will be found in Abstract XLII.

The admission ratio in the cavalry was equal to 930·0 per 1,000 and the mortality ratio 6·19 per 1,000. The highest ratio of admission and mortality in this arm of the service was 1045·4 and 8·26 per 1,000 respectively in the 13th Hussars. In the artillery the ratio of admission was 735·5, and that of mortality 8·0 per 1,000; and taking the different batteries the highest admission rate is found in 1st Battery, 1st Brigade, South Irish Division, 1803·9 per 1,000, quartered at Cape Town, and the lowest in 7th Battery, 1st Brigade, Western Division, 336·4 per 1,000, quartered at St. Helena. In the infantry the ratio of admission was 931·7 per 1,000, and that of mortality 9·00 per 1,000; in particular regiments the highest admission rate was 1471·9 per 1,000 in the Royal Scots, which corps, however, was only a few months in the Command, after return from Bechuanaland, and the lowest ratio, 702·7 per 1,000, in the South Lancashire Regiment in different stations in Natal.

The admissions and deaths, &c. in the different classes and orders of diseases are shown in Abstract No. X.

*Cape of Good  
Hope and  
St. Helena.*

**GENERAL DISEASES.—Febrile Group.**—The number of admissions for diseases of this group was 390, and there were 10 deaths, being in the ratios of 99·0 and 2·54 per 1,000 respectively. Compared with the ratios for the preceding year there is an increase of 20·4 in admission rate, but a decrease of 31 per 1,000 in death rate, while in comparison with corresponding average rates for the preceding six years the former ratio shows a decline of 84·2, and the latter one of 7·92 per 1,000.

*Enteric Fever* caused 29 admissions and 9 deaths; the ratio of admission, 7·4 per 1,000, and that of mortality, 2·29, compare favorably with those in the preceding year, 16·8 and 2·53 per 1,000, and with average similar ratios for the previous six years 41·7 and 9·02 per 1,000 respectively. The per-centage of mortality to attacks was 31, double that in the preceding year. The cases were distributed as follows:—Cape Town, 7 admissions, 2 deaths; Wynberg, 1 admission; Pinetown, 1; Pietermaritzburg, 11 admissions and 5 deaths; Etshowe, 2 and 1 death, and Rorke's Drift, 7 and 1 death. Concerning the origin of the cases at Cape Town it is stated by the medical officer in charge that in three of them the disease was undoubtedly contracted at Kimberley or Barkly West before arrival at Cape Town, and in the other four cases no specific cause could be discovered in the barracks, but from the manner in which they occurred it is probable that they were contracted in the poorer parts of the town where the disease is almost constantly present. The case returned at Wynberg is also said to have been contracted elsewhere, and for that at Pinetown no cause is given. With regard to the cases at Pietermaritzburg, it is reported by the medical officer in charge that during the month of January enteric fever prevailed, and the admissions for it were, without doubt, in great measure due to the arrival of detachments of the Argyll and Sutherland Highlanders from Etshowe. The weather was excessively hot while they were on the march, and the troops drank of the water from every sluic and source on the road. For the two cases at Etshowe no special cause is assigned, but concerning the cases at Rorke's Drift it is remarked that during the latter part of the previous year a severe epidemic of enteric fever existed, which originated among a detachment of young soldiers recently from England, employed wood cutting in the Bashee Valley (as noticed in last year's report), and at the close of the year 24 cases remained under treatment, all of which did well; but 7 fresh cases occurred in the month of January, of which one proved fatal. The Principal Medical Officer remarks that Rorke's Drift was becoming notorious for outbreaks of enteric fever, so much so that the idea of abandoning the post was mooted, but was given up on account of the political importance of the place. After the cases above mentioned no others occurred during the year, and the Principal Medical Officer remarks that the removal of the camp to higher ground, together with minute attention to all sanitary requirements may have assisted to bring about this more satisfactory state of things.

*Other continued fevers* caused 181 admissions, 29 of simple continued fever, and the remainder febricula; the ratio of admission, 45·9 per 1,000, though greater than that in the preceding year by 8·5 per 1,000, is only about half the average rate of the preceding six years.

The ratio of admission for *paroxysmal fevers* was 43·9 per 1,000, rather below the average rate, but twice that of the preceding year. All but two of the cases were returned as ague, and numbered 171, the remaining two cases being remittent fever, which occurred at Cape Town. The great majority of the cases of ague occurred at Pinetown or Pietermaritzburg.

The Principal Medical Officer remarks that ague is not a very frequent form of malarial fever in South Africa, and the increase in the admission rate, as compared with the previous year, resulted from the occurrence of cases among troops arrived from other commands, such as Mauritius, Singapore, and India. He states, also, that all these troops have greatly improved by their residence in Natal, and no doubt will shake off this form of malarial fever after a year or two in the Colony.

The remaining cases of febrile affection which occurred were five cases of erysipelas, of which one was fatal at Cape Town, one case of simple cholera at Etshowe, and one case of diphtheria at Wynberg.

*Constitutional Group.*—965 admissions and 2 deaths caused an admission rate of 245·0 per 1,000, and a mortality rate of 51 per 1,000. Compared with

*Cape of Good  
Hope and  
St. Helena.*

that in the preceding year the admission rate shows an increase of 86·6 per 1,000, and compared with the average ratio for six years an increase of 129·7 per 1,000. The increase in both these comparisons is, as will be seen, almost entirely due to the prevalence of syphilis. *Rheumatism* caused 162 admissions, equal to 41·1 per 1,000, which scarcely differs from the rate in the preceding year, and is only a little below the average rate. Among the cases 34 of acute rheumatism are returned, but no death occurred. The admissions for *primary syphilis* numbered 588, and for secondary syphilis 195, being in the ratios of 149·3 and 49·5 per 1,000 as compared with 89·0 and 24·4 in the preceding year, and with average ratios of 44·7 and 19·4 per 1,000 respectively. Including gonorrhœa and its sequelæ the ratio of admission for all forms of venereal disease amounted to 313·0 per 1,000, which is greater than the ratio in the preceding year by 121·1 per 1,000, and is three times as great as the corresponding average rate for the previous six years. The ratio of constant inefficiency on account of these affections, 21·88 per 1,000, is also considerably increased in both these comparisons, by 5·91 per 1,000 in the former, and by 13·58 in the latter. The total number of admissions for these affections was 1,233, being more than a third, or 35·5 per cent., of the total number of admissions from all causes during the year. The increase in prevalence of both primary and secondary syphilis is most marked in Cape Town. More than half the total number of cases of both forms of the disease occurred at Cape Town. The medical officer in charge remarks that a large proportion of the cases of primary syphilis were followed by secondary symptoms of extreme severity. It is stated that a Contagious Diseases Act does exist in the Colony, having been passed about two years ago, but it has never been enforced owing to want of funds. *Tubercular diseases* caused only 14 admissions, 11 being for phthisis pulmonalis, from which also there were two deaths, one occurring in an invalid after arrival at home. The remaining admissions for constitutional affections comprised two for scurvy, two for purpura, and one for lupus and anæmia respectively.

**LOCAL DISEASES.**—The ratio of admission for *diseases of the nervous system*, 8·6 per 1,000, differs only fractionally from last year's rate, but is rather below the average. Among the admissions were 6 for mental disease; there were also 3 cases of epilepsy and 2 of meningitis, sunstroke, apoplexy, and paralysis respectively. One death is recorded from meningitis, one from hemiplegia, and two from apoplexy. *Ophthalmic affections* caused an admission ratio of 13·5 per 1,000, a good deal higher than in the previous year. 16 of the admissions were due to conjunctivitis and 18 to iritis.

*Diseases of the Circulatory System* caused 51 admissions and 3 deaths, being in the ratios of 12·9 and 76 per 1,000. The admission rate differs only fractionally from that in the preceding year, but is below the average rate. Of the admissions 37 were due to palpitation, 9 to valve disease of the heart, and 5 to varicose veins. Two of the deaths were due to valve disease, and the third to aneurism of the aorta. *Respiratory affections* caused a rate of prevalence of 30·0 per 1,000, which is higher than in 1884 by 5·9, but is still below the average rate. The admissions comprised 102 for bronchial affections, 11 for pneumonia, 4 for pleurisy, and 1 for asthma. There were 4 deaths, all due to pneumonia.

*Diseases of the Digestive System* caused 384 admissions and 5 deaths, being in the ratios of 97·5 and 1·27 per 1,000 respectively. Compared with that of the preceding year, the ratio of admission has declined by 5·4, but compared with the average ratio for the previous six years by as much as 67·6 per 1,000. Tonsillitis and dyspepsia caused a great number of admissions, 77 and 94 respectively, and diarrhœa and dysentery combined show 84 admissions. Hepatic diseases caused 56 admissions, including 2 cases of abscess of the liver. The deaths were due to hepatitis in two cases, and to hepatic abscess, dysentery, and perforation of intestine, one case respectively. Among *urinary affections* the ratio of admission for gonorrhœa and its sequelæ was 114·2 per 1,000 as compared with 78·5 in 1884, and with an average ratio of the preceding 6 years of 37·3 per 1,000; but the marked increase in venereal affections has already been alluded to. Other diseases of the urinary system were more prevalent than usual, the ratio being 11·9 per 1,000. Among the cases treated were 2 of Bright's disease, of which one proved fatal. The ratios of admission for the remaining orders of local diseases are all somewhat above the average, and,



*Cape of Good Hope and St. Helena.*

with the exception of *diseases of the cellular tissue*, higher than those in preceding year. The increase in the latter comparison is most marked in the case of *cutaneous diseases*, the rate of prevalence of which has risen from 36·4 to 53·6 per 1,000; the particular diseases, however, do not call for special mention.

122 admissions are recorded for *debility*, they were principally the result of fevers; and there were 6 admissions only under the head of *poisons*, 3 being cases of delirium tremens, and 3 of alcoholic poisoning.

*Injuries*.—A case of multiple injury occurred at Cape Town, a man being run over by a train, sustaining compound fracture of the skull, leg, and arm; he died shortly after admission. There was a death at Pietermaritzburg from asphyxia by compression, due to the falling of a hut during a severe wind storm. The admissions for local injuries numbered 362, and there were 4 deaths. The ratio of admissions, 91·9 per 1,000, shows these injuries to have been more frequent than usual. More than three fourths of the admissions were due to contusions, wounds, and sprains, and there were 29 admissions for fractures and 9 for dislocations. The four deaths were all due to gunshot wounds, and all were suicidal. The cases occurred in Cape Town, Etshowe, Helpmakaar, and Pinetown respectively. In each case a verdict of temporary insanity was returned, but the motives for the acts were not discovered. A severe case of horse bite on the thumb was followed by gangrene, and necessitated amputation of the forearm, which was successfully performed.

*Invaliding*.—158 men were invalided home during the year, and 85 were finally discharged as medically unfit for further service, being in the ratios of 40·11 and 21·57 per 1,000 respectively. Compared with the corresponding rate for the preceding year the ratio of invaliding home has increased by 16·35 per 1,000, and that of final discharge by 7·32 per 1,000; and in comparison with average rates for the previous decennial period a decline of 17·70 per 1,000 has taken place in the former, and a fractional increase in the latter. The principal causes of invaliding were rheumatic affections 15 cases, secondary syphilis 14, phthisis pulmonalis 8, mental disease 4, heart disease 19, hepatic affections 9, and general debility 37 cases. The principal disabilities causing final discharge by invaliding were rheumatic affections 5 cases, phthisis pulmonalis 7, diseases of the nervous system 5, ophthalmic affections 5, aural diseases 6, diseases of the circulatory system 22, of the digestive system 5, and of the organs of locomotion 5, debility 8, and the effects of injury 5 cases.

*Officers*.—The average strength is recorded as 165, the attacks of illness 80, and there was one death. The rate of prevalence of sickness was, therefore, 484·8 per 1,000, and that of mortality, 6·06 per 1,000; the former being higher than that in the preceding year by 83·5, and the latter lower by 13·68 per 1,000. The principal causes of illness were fevers (including two cases of enteric fever, one of which had a fatal termination), rheumatic affections, digestive disorders, debility, and injuries. 14 officers were invalided, being in the ratio of 84·84 per 1,000, a considerable increase on the rate in 1884. The causes of invaliding were debility, 7 cases, dyspepsia 2, and chronic rheumatism, bronchitis, pneumonia, hepatitis, and abscess one case respectively.

*Women*.—In an average strength of 222 women there were 125 cases of illness and 2 deaths, equal to ratios of 563·1 and 9·01 per 1,000, as compared with 529·4 and 5·35 per 1,000 in the preceding year. The principal affections causing sickness were digestive and uterine disorders, debility, rheumatism, and febrile affections. The deaths were caused by phthisis pulmonalis and dysentery, one case respectively.

*Children*.—95 attacks of illness are recorded in an average strength of 372 children, and 11 deaths occurred. The rate of prevalence of sickness was therefore 255·4, and that of mortality 29·57 per 1,000; the former showing an increase of 5·4, and the latter one of 3·57 per 1,000, as compared with the corresponding ratio in the preceding year. Among the cases treated were 25 of febrile affections, 19 of bronchitis, and 14 of diarrhoea. The causes of death were convulsions, bronchitis, and peritonitis, two cases each, and chronic hydrocephalus, laryngitis, diarrhoea, dentition, and debility, one case respectively.

*Sanitary Conditions.*—The Principal Medical Officer states in his annual report that “the sanitary condition of the Command was very fairly satisfactory throughout the year, and that the health of the troops has responded to the improved conditions under which they live.” The prevalence of enteric and climatic fevers considerably diminished, and the health of the troops was exceptionally good, except as regards those quartered in Cape Town and Pietermaritzburg, where the admission rate was augmented by the prevalence of venereal disease. *Cape of Good Hope and St. Helena.*

It is reported that a great many improvements had been carried out, or were in progress during the year. Among them was the institution of a sanitarium at Wynberg, the situation of which is good and well elevated. Two huts, capable of accommodating 25 men each, have been erected for hospital purposes. At Wynberg, also, barracks for a wing of a regiment are to be built in place of renewing some old barracks at Cape Town, which are out of repair. It is remarked it would be beneficial if arrangements could be made to locate elsewhere the troops now quartered in the castle.

There was no material change in the water supply during the year either in Cape Town or Natal, and in the stations where the greater part of the troops are quartered the water is of excellent quality.

With regard to conservancy it is stated that as a rule the dry earth system is carried out through the Colony, not as satisfactorily as in India, perhaps, as labour is so much more expensive, but still it is preferable to any other means of removing excreta. The drainage arrangements of Cape Town are said to be indifferent, and attention is particularly drawn to the fact that the outlets from the system of drainage open on to the seashore above low water mark within a short distance of the military hospital, and that in consequence the smell of the sewage has at times been a great evil. Representation was made to this effect, with the result that arrangements have been made for the removal of these outlets to a more satisfactory situation. The drainage of the hospital is said to have been in an unsatisfactory condition for years, but now the dry earth system has been taken into use throughout with good results.

No complaints were received regarding the married quarters in the different stations in the Command, except those at Cape Town, and from these not so much on the score of health as their unsuitability for the purpose. It is, however, expected that as barrack accommodation is proceeded with at Wynberg, arrangements will also be made for the provision of married quarters there, which will supersede those now existing in Cape Town.

With reference to the movement of troops the Principal Medical Officer recommends that, “if possible, troops should not be sent to this Command during the rainy season. In the regulations the proper time of arrival is shown as between March and October, but it appears to have been lost sight of that in Natal the rains prevail in the summer, and at Cape Town in the winter months; and it is especially advisable that troops coming from malarial countries such as Mauritius or even India should not land in South Africa in the rains. Representations have been made and are receiving every consideration.”

The Senior Medical Officer at St. Helena shows in his annual report that the sanitary conditions generally as well as the health of the troops in that island were very satisfactory. The climatic conditions were pleasant and favorable to health, though the rainfall was considerably below the average, but this was not attended by any undue rise of temperature, nor did it interfere with a sufficient water supply. The condition of the barracks is said to be very good, also that of the married quarters and hospital, to the latter a new pack-store and a linen room have been added during the year; the drainage, conservancy, &c. are also reported to be in satisfactory order.

# IX.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF MAURITIUS.

## Sickness and Mortality.

### Mauritius.

The average strength of warrant officers, non-commissioned officers and men serving in the Command during the year was 358, and the force was composed of a battery of Royal Artillery; a detachment 1st Battalion Welsh Regiment, relieved in October by a detachment 1st Battalion Royal Inniskilling Fusiliers; a few men of the Royal Engineers and Departments, and the Garrison Staff.

The admissions into hospital were 898 in number, the deaths 6, and the average constantly non-effective through sickness 29·51; the ratio of admission to strength was therefore equal to 2508·4 per 1,000, that of mortality to 16·76, and that of constantly sick to 82·43 per 1,000. Compared with corresponding rates in the preceding year an increase of 213·6 per 1,000 is observed in the admission ratio, but the ratios of mortality and constantly sick have declined by 5·27 and 13·30 per 1,000 respectively. In comparison with the average similar rates for the preceding 10 years there is an increase of 321·5 per 1,000 in the rate of admission, and one of 3·28 in that of constantly sick, but the mortality rate shows a fractional decrease. The average sick time to each soldier was 30·09 days, and the average duration of each case of sickness 11·99 days, which compare favorably with 35·03 and 15·26 days respectively in the preceding year, but the former is slightly longer and the latter shorter than the average periods in the previous 10 years. The Senior Medical Officer, Brigade Surgeon T. Symons, remarks "that the general health of the troops is considered to have been more satisfactory during 1885 than in either of the two previous years, for although the actual number of admissions has been higher the number constantly sick has been lower. The increase in the admission rate was mainly due to malarial fever, which, in the earlier months of the year, was more than usually prevalent, both in the civil and military population. The improved state of health (it is believed) is largely attributable to the removal of the main body of the infantry detachment from Port Louis, and the prompt transfer of sick from that place for treatment at Curepipe."

The more important of the health statistics of the different corps which served in the Command are given in Abstract XLII. The annual admission and constantly sick rates for the Welsh Regiment were very high, reaching 3287·9 and 100·71 per 1,000 respectively; those of the Royal Inniskilling Fusiliers were 1867·9 and 62·64 per 1,000. The ratio of admission of the artillery, 1619·0 per 1,000 has decreased by 110·4 from that of the preceding year.

The admissions, deaths, &c. in the various classes and orders of diseases are shown in Abstract XI.

**GENERAL DISEASES.—Febrile Group.**—The total number of admissions was 533, and there were 5 deaths; the ratio of admission, 1488·8 per 1,000, is in excess of that in the preceding year by 108·7, and of that of the average of the preceding six years by 225·4 per 1,000. The mortality rate, 13·97 per 1,000, has, however, declined from that in the previous year by 2·56 per 1,000, though it is still above the average rate. Three admissions are shown as *continued fevers*; of these two were caused by enteric fever, and both had a fatal result. They were admitted in January at Curepipe, where one case originated; the other was contracted at Port Louis. It is stated that they were of a typho-malarial character, and that it was impossible to trace their origin to any definite source.

*Paroxysmal Fevers* show 529 admissions and 3 deaths; the ratio of admission, 1477·6 per 1,000, is an increase of 119·5 on that in the preceding year, and one of 278·9 per 1,000 on the average rate of the preceding 6 years.

The ratio of constant inefficiency from these fevers was, however, considerably lower than in 1884, and to some extent below the average rate, showing that though more persons were attacked yet the type of the disease was, as a rule, milder. Of the total number of cases 480 were ague, and the remainder remittent fever: the three fatal cases were due to the latter cause.

With regard to the effect of the occupation of Curepipe on the prevalence of malarial fever, the Senior Medical Officer remarks that "the actual value of Curepipe cannot be definitely ascertained while troops for duty at that station arrive in an unhealthy state and already contaminated by previous residence in a malarial climate. It often happens that those who have been subjected to malarial influences elsewhere experience frequent attacks of paroxysmal fever during their first months of residence at Curepipe, consequent, it would appear, on the sudden variations of temperature and cold, damp air producing constitutional disturbance."

The Senior Medical Officer also mentions, in connexion with the foregoing, that it is unfortunate that the infantry relief which took place during the year should have consisted of troops who had been serving at Singapore, at which place nearly two thirds of them had suffered from malarial disease.

He notes as worthy of remark that "the close investigation of 638 admissions for malarial fevers at Curepipe during the past two years has not disclosed any case which could exclusively be said to have originated at that station. On the other hand, various medical men in civil practice are of opinion that fever now appears at higher elevations than formerly, and some even assert that it is communicable from one individual to another, but nearly all are united in considering the type of the disease less malignant. The increasing frequency of fever cases in the highlands may in part be accounted for by the rapid growth of a very mixed and contaminated population in the upper parts of the island, which, until recent years, were but very sparsely inhabited."

In the constitutional group of diseases 72 admissions are recorded, equal to 201.1 per 1,000, being a decrease from the rate in the previous year, as well as from the average rate of six years. 15 admissions were recorded for *rheumatism*, but only one case is reported to have been of the acute form. *Primary syphilis* caused 46 admissions, and secondary syphilis 8, the ratios per 1,000 of strength being 128.5 and 22.3 respectively. The rate of prevalence of the primary affection is lower than the rate in the preceding year by 23.0, and than the average rate by 18.3 per 1,000, while the rate of the secondary disease shows an increase as compared with the year 1884, but is still a good deal below the average. Including all forms of venereal disease, the ratio of admission was 248.6 per 1,000, slightly below that of the previous year, but considerably below the six years' average rate. The ratio of constant inefficiency from these affections was 17.62 per 1,000, which also shows a decline in both these comparisons. *Tubercular diseases* show only 3 admissions; 2 for phthisis pulmonalis and 1 for hæmoptysis.

**LOCAL DISEASES.**—As in the previous year the admissions under the different orders of local diseases, except diseases of the digestive and of the urinary system, were very few in number. *Nervous diseases* show 5 admissions, of which 4 were due to mania. *Diseases of the Circulatory System* caused 14 admissions, all but one being for palpitation. *Respiratory diseases* numbered 17 cases of bronchial affection.

*Diseases of the Digestive System* caused 87 admissions, equal to a ratio of 243.0 per 1,000, which, though a decline from the rate in the foregoing year, is almost identical with the average rate. The greater part of the illness caused by digestive disorders was attributable to dysentery and diarrhoea, 13 men having been admitted for the former and 34 for the latter. One case of dysentery at Curepipe terminated fatally. The Senior Medical Officer remarks that in many instances these diseases were due to the dampness of the climate of Curepipe and its constantly and rapidly varying temperature, but very often also bowel affections were brought on by personal indiscretion. Eight cases of hepatitis and 7 of splenitis are recorded. 41 admissions are returned for *urinary affections*, of which 35 were due either to gonorrhoea or its sequelæ, and were equal to a rate of 97.8 per 1,000, rather above the rate in the preceding year but below the average. With regard to these affections and to

*Mauritius.*

venereal disease generally, the Senior Medical Officer remarks that the type has been moderate in character, and that disease in almost all instances was contracted in Port Louis. The remaining orders of local disease call for no special mention, very few admissions occurring in each, *diseases of the cellular tissue* and *cutaneous affections* only reaching double figures, 14 and 19 respectively. Local diseases, therefore, do not contribute greatly to the sickness in Mauritius; indeed, with the exception of gonorrhœa and intestinal affections, to very slight extent. About three fifths of the illness is due to malarial fever alone.

*Debility* was the cause of 21 admissions, equal to 58·7 per 1,000. Most of the cases were consequent on repeated attacks of malarial fever.

*Poisons* are represented by only one case of delirium tremens, as in the preceding year.

*Injuries.*—No case of general injury is recorded, but 42 of a local character occurred. They were mostly of a simple nature, and call for no special mention.

*Invaliding.*—14 men were invalided to England, equal to a ratio of 39·10 per 1,000, which has declined from that in preceding year by 7·73, and is below that of the average of the preceding ten years by 6·10 per 1,000. The causes of invaliding were debility (after malarial fever) 5 cases, dysentery 2, heart disease 2, and phthisis pulmonalis, mania, bronchitis, hernia, and hepatitis, one case respectively. Five men, being in the ratio of 13·97 per 1,000, were finally discharged the service during the year, which, compared with the rate for the preceding year, shows an increase of 5·71 per 1,000, and in comparison with that of the decennial average, a fractional decrease. The causes of final discharge were mania, paralysis, hypertrophy of the heart, dysentery, and hernia, one case respectively.

*Officers.*—In an average strength of 22 there were 7 attacks of illness, of which 4 were due to remittent fever and 1 to ague. The sick rate, calculated from these figures, 318·3 per 1,000, has declined considerably from that in the previous year.

*Women and Children.*—25 attacks of illness are recorded in an average strength of 15 women; the rate of prevalence thus shown has declined from that in 1884. Of the cases treated, 10 were malarial fevers and 12 debility, in most instances following malarial fever. In an average strength of 34 children, 24 attacks of illness and 5 deaths are returned; the sick rate was therefore 705·9 per 1,000, and the mortality rate very high. More than half the cases treated were due to remittent fever or ague. Three deaths were caused by remittent fevers, one by diarrhœa, and the other by premature birth.

It is remarked that the figures regarding women and children, and, indeed, also those regarding the officers, do not show the full amount of sickness among them, as mild attacks of fever are of constant recurrence.

*Sanitary Conditions.*—The Principal Medical Officer shows in his annual sanitary report that the principal incident affecting the health of the troops during the year was the continued extension of barrack accommodation on the high land, thus admitting of a further considerable reduction in the strength of the detachment of infantry quartered in the notoriously unhealthy Line barracks at Port Louis; in fact, the number of men now resident in them is only about 30, who are employed in the Ordnance Store or as prison warders.

With regard to Curepipe, the increase and improvement in barrack accommodation has been continued, and the Senior Medical Officer remarks that “at the close of 1884 the barracks comprised three large wooden huts raised on stone foundations; during the past year the accommodation has been very considerably increased by the construction of various buildings. The most important addition has been the erection of two new huts, together affording good and ample accommodation for 100 non-commissioned officers and men. The general principles of construction are like those before described, each block being divided into two large rooms by a transverse passage. A new cook-house has been built, comprising a kitchen for the men and also one for the sergeants’ mess. The adaptation of two of the original buildings, an old barrack store and an adjacent married quarter, which have been coupled together by the construction of an intermediate room, has produced a canteen, both slightly in appearance and ample as to

“accommodation. A block has been completed and occupied as married quarters; it comprises three quarters, each having two rooms; they are rather small and also cheerless, light being partially excluded by the necessary verandah.”

With regard to the drainage of the place, it is pointed out that a thorough and comprehensive system is very essential, and that the required service was about to be taken in hand.

The walls of the hospital at Curepipe are said to be “still rather damp, and though cemented on the interior surface, moisture is transmitted owing to the porosity of the stone and the saline character of the sand with which the mortar was mixed. The wards, though lofty and lighted by numerous windows on either side, are rather gloomy, owing to the overhanging verandahs, which are necessary as a defence against the driving rain. The detached infectious ward which has been completed has been employed for the treatment of special cases, necessity for its use for infectious cases not having arisen.

“Endeavours were made during the year to reclaim the jungle and waste land in front of the hospital for the formation of airing and recreation grounds for the patients; the work is laborious, but the unsightly waste will, before long, be transformed into grass slopes, terraces, flower beds, &c., and the enclosure will comprise some 8,000 square yards.”

---

## X.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF CEYLON.

### *Sickness and Mortality.*

#### I.—WHITE TROOPS.

##### *Ceylon.*

The force serving in Ceylon consisted of the 5th and 6th Batteries, 1st Brigade, Eastern Division, Royal Artillery, the 1st Battalion Royal Dublin Fusiliers, the 1st Battalion Argyll and Sutherland Highlanders, detachments Royal Engineers and Departmental Corps, and Garrison Staff.

The Argyll and Sutherland Highlanders arrived in the island from Natal in November, relieving the Royal Dublin Fusiliers. One battery of artillery, No. 5, 1st Brigade, Eastern Division, left for Hong Kong in December. Drafts for the different corps in garrison arrived from England in December.

The average strength of warrant officers, non-commissioned officers, and men was 809. The admissions into hospital numbered 950; there were 8 deaths, including one of an invalid after arrival at home, and 51.13 men were constantly sick. The ratio of admission, therefore, was 1174.3 per 1,000, that of mortality 9.89, and that of constant inefficiency through sickness 63.20 per 1,000. Compared with corresponding ratios in the preceding year a decrease of 23.7 per 1,000 has taken place in the admission rate, one of 1.28 in the death rate, and one of 4.29 in the constantly sick rate; but compared with average similar ratios for the preceding decennial period an increase of 88.9 per 1,000 is observed in the admission ratio, and one of 5.75 in that of constantly sick, and a decrease of 4.62 per 1,000 in the rate of mortality. The average sick time to each soldier was 23.07 days, and the average duration of each case of sickness, 19.64 days, being shorter than the corresponding periods in the previous year by 1.63 days and .98 days, and longer than the average duration of similar periods in the preceding 10 years by 2.10 days and .32 days respectively.

The most important of the health statistics of the different corps which served in the island are given in Abstract XLII. The ratio of admission in the artillery was 1164.1 per 1,000, and that in the infantry 1,219.9 per 1,000, the former showing a decrease and the latter a slight increase as compared with the preceding year. The number of men constantly inefficient in the artillery was equal to a ratio of 66.05 per 1,000, and in the infantry to one of 64.40 per 1,000, which are lower than the corresponding ratios in the previous year. Of the 8 deaths 4 occurred in the artillery and 4 in the infantry. The highest admission rate of any single corps was 1678.6 per 1,000 in the Argyll and Sutherland Highlanders, but this regiment was only a few weeks in the Command.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract XII.

**GENERAL DISEASES.—*Febrile Group.***—There were 132 admissions, 1 death and 4.37 men were constantly sick. The admission ratio, therefore, was 163.1 per 1,000, the death rate 1.24, and that of constantly sick 5.40 per 1,000. Compared with the returns for the previous year an increase of 71.7 per 1,000 has taken place in admission rate, and one of .98 in constantly sick rate; and compared with average corresponding rates for the previous six years the increase is equal to 46.9 and 1.17 per 1,000 respectively. The ratio of mortality has declined in both these comparisons.

*Eruptive fevers* were represented by one case of measles. Small-pox was prevalent among the inhabitants at Trincomalee early in the year, and at Colombo later, but no case occurred among the military. *Enteric fever* caused one admission at Trincomalee; the case proved fatal. The origin of this case was not discovered, but the Senior Medical Officer, Brigade Surgeon J. Landale, M.D., states that owing to defective water supply, &c. this

disease is of frequent occurrence among the civil population throughout the island. *Other continued fevers* caused 64 admissions, being at the rate of 79.1 per 1,000, an increase of 32.2 per 1,000 on the rate in the previous year, but below the average rate by 5.5 per 1,000. 20 cases are returned as simple continued fever, and the remainder as febricula. The Senior Medical Officer states that all the cases were due to ordinary climatic causes, and that the majority of the admissions were in the months of October and November immediately previous to, and shortly after, the setting in of the north-east monsoon, when a strong land wind prevails. *Paroxysmal fevers* gave rise to 66 admissions, 49 for ague and 17 for remittent fever, being at the rate of 81.6 per 1,000, an increase of 50.1 on the rate in the previous year, and considerably above the average rate. The majority of the cases of ague occurred amongst men who had served, or were serving, at out stations. 12 out of the 17 cases of remittent fever occurred at Trincomalee, and it is stated by the medical officer in charge that they were mainly due to the situation of the station in a necessarily malarious district.

*Constitutional Group*.—167 admissions are returned under this head, the ratio being 206.4 per 1,000, below the rate in the preceding year by 57.6, and below the average rate by 8.4. The sickness in this group of diseases was mainly caused by syphilis, six sevenths of the admissions being due to that disease. *Rheumatism* caused 20 admissions, equal to a ratio of 24.7 per 1,000, which is below the average as well as the rate in the foregoing year. Only one case of acute rheumatism is returned. *Primary syphilis* was the cause of 126 admissions, and secondary syphilis of 19, being in the ratios of 155.7 and 23.5 per 1,000 respectively. The ratio for primary syphilis has declined from that in the preceding year by 42.3, though it is still higher than the average rate by 10.5 per 1,000. The rate for secondary disease has decreased in both these comparisons, in the former by 7.0 and in the latter by 5.7 per 1,000. Including gonorrhœa and its sequelæ the ratio of admission for all forms of venereal disease was 343.6 per 1,000, being lower than the rate in the previous year by 31.1, but above the average rate of the preceding six years by 51.7 per 1,000. The ratio of constant inefficiency on account of these affections was 23.01 per 1,000, being lower than in 1884 by 2.77 but higher than the average by 4.69 per 1,000. The Senior Medical Officer points out that though there is a Contagious Diseases Act it has not proved of great benefit, partly from its inefficient working and partly from the fact that the majority of cases of disease are contracted from unlicensed prostitutes. There were 2 admissions for *tubercular disease*, both cases of phthisis pulmonalis. There was one fatal case, being that of a man who was remaining under treatment at the close of the previous year.

*LOCAL DISEASES*.—*Diseases of the Nervous System* caused an admission ratio of 6.2 per 1,000 only, which compares very favorably with 14.2 in the preceding year and with an average rate of 18.0 per 1,000. The admissions only numbered 5, and comprised 2 for neuralgia and 1 for sunstroke, paralysis, and mania respectively. *Ophthalmic affections* show a marked increase in prevalence, the ratio, 32.2 per 1,000, being 14.9 higher than in the preceding year, but nearly all the cases were simple conjunctivitis from ordinary causes, and quickly recovered. *Aural affections*, 23.5 per 1,000, were more frequent than usual, but about the same as in the previous year.

*Under diseases of the Circulatory System* 10 admissions only for palpitation are returned, giving a ratio of 12.4 per 1,000, being below the average by 4.2.

*Diseases of the Absorbent System* caused 20 admissions, all from inflammation of glands, giving a ratio of 24.7 per 1,000, considerably below the average rate and that in the previous year. *Respiratory affections* caused 15 admissions, equal to a ratio of 18.5 per 1,000, which has declined greatly from that in the previous year, 44.7, and is also a good deal below the average. The cases were either bronchial catarrh or bronchitis, and there was one death from the latter disease.

*Diseases of the Digestive System* caused 133 admissions and 4 deaths (including one of an invalid); the ratio of admission, therefore, was 164.4 per 1,000, and that of mortality 4.94, as compared with 192.9 and 5.07 per 1,000 in the preceding year, and with average rates for the previous six years 264.8 and 6.39 per 1,000 respectively. *Dyspepsia* and *diarrhœa* caused each 25 admis-



*Ceylon.*

sions, dysentery 12, and hepatic affections 26. The deaths were due to hepatitis in two cases, and to enteritis and abscess of the liver in one case respectively.

Among *urinary diseases* 133 admissions are returned for gonorrhœa and its sequela, being in the ratio of 164·4 per 1,000, being greater by 18·2 than the rate in the preceding year, and also above the average rate. Other diseases of the urinary system caused 18 admissions, of no special importance. The remaining orders of local diseases do not show any marked difference in prevalence, and call for no particular remark, except in the case of *diseases of the cutaneous system*, in which the ratio of admission, 121·2 per 1,000, shows an increase of 22·7 over the preceding year and of 16·0 above the average. The cases, however, call for no special mention.

*Debility* gave rise to 15 admissions, being at the rate of 18·5 per 1,000, a decrease on that of the preceding year. This condition was usually the result of some exhausting disease, from the effects of which, in consequence of the enervating nature of the climate, the system did not readily recover.

*Poisons* caused 12 admissions, 6 for delirium tremens, the remainder for alcohol, the rate of prevalence, 14·8 per 1,000, being fractionally lower than in the previous year.

*Injuries.*—No case of general injury occurred, but local injuries caused 111 admissions, or at the rate of 137·2 per 1,000, slightly below the rate in the former year. The principal injuries causing admissions were contusions, wounds, and sprains. One death occurred resulting from compound fracture of the arm with contusion and laceration of the muscle; after a few days tetanus supervened and the case proved fatal.

Amputation of the index finger of the right hand was necessary in the case of a man, who had sustained a severe injury to it through the fall of a musketry target.

*Invaliding.*—The number of men invalided to England was 24, being at the rate of 29·66 per 1,000, which is lower than the corresponding rate in the previous year by 2·83, and than that of the average of preceding six years by 8·57 per 1,000. The causes of invaliding were hepatitis 5 cases, debility 4, mental affection, phthisis pulmonalis, and dysentery 3 each, and rheumatism, deafness, palpitation, bronchitis, fracture, and accidental gunshot wound, one case respectively. There were also 16 men finally discharged the service by invaliding, being in the ratio of 19·78 per 1,000, which, when compared with the ratio for the preceding year, shows an increase of 6·58 per 1,000, and in comparison with that of the previous 10 years' average an increase of 5·67 per 1,000. The causes of final discharge were mental affections 4 cases, phthisis pulmonalis, aural diseases, digestive disorders, and effects of injury 2 cases each, and keratitis, pneumonia, and debility one case respectively.

*Officers.*—In an average strength of 45 officers there were 22 attacks of illness, equal to a rate of prevalence of 488·9 per 1,000, which is lower than that in the preceding year by 82·5 per 1,000. The prevailing diseases were febrile and digestive disorders, and debility. Two officers were invalided on account of debility.

*Women and Children.*—Seven attacks of illness are recorded in an average strength of 40 women, the sick rate being much lower than in the previous year. In average strength of 75 children, 21 attacks of illness are shown, or at the rate of 280·0 per 1,000. The diseases causing the majority of the admissions were fevers, convulsions, and bowel affections. Six deaths occurred, three from convulsions, and one from dysentery, diarrhœa, and premature birth respectively.

*Sanitary Conditions.*—The annual report of the Senior Medical Officer shows that, generally speaking, the sanitary conditions affecting the troops were satisfactory, and the barracks and their vicinity in good order at all out-stations; the defects with regard to surface drainage, barrack and hospital flooring at Trincomalee, alluded to in last report, having been remedied.

The condition of the canal or moat at the back of the barracks at Colombo, referred to in former reports, remained in the same unsatisfactory state; it is reported, however, that there is a probability of this being filled in, a grant of money having been sanctioned for the purpose.

The Senior Medical Officer remarks that "at Colombo the water supply is not altogether satisfactory; it is derived from wells in barracks, which become very low during the hot and dry season, and when there is a scanty rainfall. It was hoped that the defect would have been remedied ere this, as a fresh water supply is being brought into Colombo from a distance of 25 miles for the use of the civil population, and is to be distributed throughout barracks, but in consequence of the wall of the main reservoir having cracked, prolonged delay is likely to result." *Ceylon.*

It is reported that there was no overcrowding in barracks, and ventilation, &c., was satisfactory. Complaints of want of variety in the rations were made, beef being invariably issued, and in consequence the issue of salt pork at least one day a week has been recommended. The more frequent issue of potatoes is also mentioned as desirable. The cooking arrangements are said to have been satisfactory.

No new buildings were erected during the year, but necessary works of maintenance, together with minor alterations, were carried out; also some drainage improvements effected, and increased latrine accommodation provided in certain barracks.

The sea swimming bath, which has been recommended for some time, has not yet been sanctioned, but it is stated that the matter is to be considered in the estimates for the ensuing year.

---

## II. BLACK TROOPS.

The native troops consist of one company of Gun Lascars and the Ceylon Mounted Orderlies. The former are distributed between the stations of Colombo, Galle, and Trincomalee; the latter, quartered at Colombo, act as body guard to the governor of the island.

The average strength of the above was 99, and the admissions into hospital 47, equal to a rate of 47·47 per 1,000. There was no disease especially prevalent, but those which caused the majority of the admissions were febrile and digestive affections, together with local injuries. One death occurred from phthisis pulmonalis, and one man was discharged the service by invaliding on account of deafness. The general health of the troops is reported to have been good.

---

# **XL.—ON THE HEALTH OF THE TROOPS SERVING IN CHINA AND THE STRAITS SETTLEMENTS.**

## *Sickness and Mortality.*

### **I.—WHITE TROOPS.**

*China and  
Straits  
Settlements.*

The average strength of the troops serving in the Command during the year was 2,188, and the force was composed as follows:—Three batteries of the Southern Division Royal Artillery, one of which arrived from England in June, and one battery Lancashire Division Royal Artillery; the 1st Battalion Royal Inniskilling Fusiliers (at Singapore) being relieved by the 1st Battalion East Kent Regiment in October; the 2nd Battalion East Kent Regiment (at Hong Kong) being relieved by the 2nd Battalion Northamptonshire Regiment in November; a detachment Royal Engineers, the strength of which was increased during the year; and detachments, Commissariat and Transport Corps, Medical Staff Corps, Ordnance Store Corps, and Garrison Staff.

The admissions into hospital were 2,454 in number, the deaths 25, including that of an invalid after having left the Command, and there were 93·97 men constantly ineffective through sickness. The ratios per 1,000 of strength were, therefore, for admission 1121·6, for mortality 11·43, and for constantly sick 42·95. Comparing these with the corresponding rates in the previous year an increase of 141·7 per 1,000 is observed in that of admission, one of 4·39 in that of mortality, but a decrease of 3·94 in that of constant inefficiency; and in comparison with the corresponding average rates for the preceding 10 years the ratios of admission and mortality are increased by 91·2 and 90 per 1,000 respectively, while the constantly sick rate has declined by 6·57 per 1,000. The average sick time to each soldier was 15·68 days, and the average duration of each case of sickness 13·98 days, which are shorter than the corresponding periods in the previous year, the former by 1·48 days and the latter by 3·54 days; and in comparison with the average duration of these periods in the preceding 10 years the former is shorter by 2·39 days and the latter by 1·48 days.

The proportions in which the two divisions of the Command contributed to these results are shown in the following table:—

Stations.	1885.		Died.			Invalided Home.	Ratio per 1,000.				Average Sick time to each Soldier.	Average Duration of each Case of Sickness.	East Straits Settlements.
	Average Strength.	Admissions into Hospital.	In the Command.	Invalids.	Total.		Admissions.	Deaths.	Invalided.	Average daily Sick.			
Hong Kong -	1,114	987	17	1	18	44	41·70	885·9	16·16	39·50	37·48	Days. 13·06	Days. 15·42
Straits Settlements.	1,074	1,467	7	—	7	45	52·27	1365·9	6·52	41·90	48·67	17·76	13·01

In the Hong Kong division of the Command an increase is observed in admission rate, equal to 26·2 per 1,000, and one in the death rate, equal to 7·69 per 1,000; there is, however, a decline in the ratio of invaliding, and in that of constantly sick, as compared with corresponding ratios in the preceding year. The average sick time to each soldier, as well as the average duration of each case of sickness, are also shorter. In the Straits Settlements there was a considerable increase in admission rate, equal to 248·2 per 1,000; also an increase in the mortality and invaliding rates, 1·12 and 10·58 per 1,000 respectively, as

compared with the previous year. In the constantly sick rate there was a *China and fractional decrease*, and both the average sick time to each soldier and the *Straits average duration of each case of sickness are shorter.* *Settlements.*

The Principal Medical Officer, Deputy Surgeon-General R. Hungerford, reports that "the general health of the troops in the Command has not been so good as in the previous year, chiefly owing to fever, both in the Straits Settlements and in Hong Kong, and to the occurrence of an outbreak of cholera at the latter station."

With regard to the health of the different corps which served in the Command, the statistics of which are given in Abstract XLII., it is observed that in the Royal Artillery the admission and constantly sick rates, 820.7 and 35.55, per 1,000, have declined by 225.3 and 11.44 per 1,000 respectively, and it is said that the comparatively small number of admissions from the 8th and 9th Batteries, 1st Brigade, Southern Division, contributed materially to this result. An increase, however, occurred in the rates of mortality and invaliding.

The 2nd East Kent Regiment shows an increase of admission rate of 85.9 on the rate of the previous year, 795.8 per 1,000, and the rate of mortality is more than doubled, reaching 16.90 per 1,000. This regiment, it is stated, suffered severely during the outbreak of cholera in Hong Kong in June and July, 8 of the 11 men who died during those months having belonged to it, and one other man died of the disease in October.

The ratio of admission for the 1st Royal Inniskilling Fusiliers, 1,567.8 per 1,000, has increased on that of 1884 by 366.5. This is principally due to the prevalence of fevers. The mortality and constantly sick rates declined fractionally from those in the preceding year.

The 1st Battalion East Kent and the 2nd Northamptonshire Regiments only arrived in the Command in October; their statistics can hardly therefore be taken as fairly indicative of the effect of the climate, &c. on their health, as many of the admissions within a short time of their landing were for ailments contracted before arrival in the Command.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract XIII.

**GENERAL DISEASES.—Febrile Group.**—In this group are recorded 801 admissions and 16 deaths, being in the ratios of 366.1 and 7.31 per 1,000 of strength; and the ratio of constantly sick was 8.73 per 1,000. Compared with corresponding rates in the preceding year the ratio of admission has increased by 93.5 per 1,000, principally owing to the prevalence of fevers at Tanglin: the ratio of mortality is greater by 5.30 per 1,000, due to the occurrence of cholera; and there is a fractional increase in the constantly sick rate. In comparison with average similar ratios for the previous six years, the increase of admission rate equals 81.2 per 1,000, that of death rate 5.65, and that of constantly sick 64 per 1,000.

*Enteric Fever* caused four admissions and one death. One case occurred at Hong Kong; it was of a severe character, and it came from the married quarters, but no local insanitary cause could be discovered. It is said, however, that several cases of this disease had occurred among the civil population. The other three cases took place at Fort Canning, Singapore, of which one was fatal. Of these it is said that in all the disease was contracted before arrival at the station. Three cases of typhus fever, one with fatal result, are reported to have occurred at Tanglin. The medical officer in charge states that they were all of a severe type, and, in his opinion, were due to overcrowding, which at that time existed in certain barracks and a temporary guard room. *Other continued fevers* returned 419 admissions, equal to a ratio of 191.5 per 1,000. Of these, 39 only occurred in Hong Kong, the remainder in the Straits Settlements, 332 being returned from Tanglin alone, due chiefly to climatic causes, heat and exposure. The prevalence of these fevers is greater in the year under report than the average of the preceding six years by 32.0 per 1,000, but there is very little difference in the rate of constantly sick.

*Paroxysmal Fevers* show 349 admissions and one death, equal to ratios of 159.5 and .46 per 1,000. The admission ratio is greater than that in the preceding year by 24.7, and than the average rate by 40.6 per 1,000; and the rate of constant inefficiency on account of those fevers, 3.82 per 1,000, is also above the average. Of the cases, 301 were ague and 48 remittent fever;

## XI.—ON THE HEALTH OF THE TROOPS SERVING IN CHINA AND THE STRAITS SETTLEMENTS.

### *Sickness and Mortality.*

#### I.—WHITE TROOPS.

*China and  
Straits  
Settlements.*

The average strength of the troops serving in the Command during the year was 2,188, and the force was composed as follows:—Three batteries of the Southern Division Royal Artillery, one of which arrived from England in June, and one battery Lancashire Division Royal Artillery; the 1st Battalion Royal Inniskilling Fusiliers (at Singapore) being relieved by the 1st Battalion East Kent Regiment in October; the 2nd Battalion East Kent Regiment (at Hong Kong) being relieved by the 2nd Battalion Northamptonshire Regiment in November; a detachment Royal Engineers, the strength of which was increased during the year; and detachments, Commissariat and Transport Corps, Medical Staff Corps, Ordnance Store Corps, and Garrison Staff.

The admissions into hospital were 2,454 in number, the deaths 25, including that of an invalid after having left the Command, and there were 93·97 men constantly inefficient through sickness. The ratios per 1,000 of strength were, therefore, for admission 1121·6, for mortality 11·43, and for constantly sick 42·95. Comparing these with the corresponding rates in the previous year an increase of 141·7 per 1,000 is observed in that of admission, one of 4·39 in that of mortality, but a decrease of 3·94 in that of constant inefficiency; and in comparison with the corresponding average rates for the preceding 10 years the ratios of admission and mortality are increased by 91·2 and 90 per 1,000 respectively, while the constantly sick rate has declined by 6·57 per 1,000. The average sick time to each soldier was 15·68 days, and the average duration of each case of sickness 13·98 days, which are shorter than the corresponding periods in the previous year, the former by 1·48 days and the latter by 2·01 days; and in comparison with the average duration of these periods in the preceding 10 years the former is shorter by 2·39 days and the latter by 1·01 days.

The proportions in which the two divisions of the Command contribute to these results are shown in the following table:—

Stations.	1885.	Average Strength.	Admissions into Hospital.	Died.			Invalided Home.	Average daily Sick.	Ratio per 1,000.				Average Sick time to each Soldier.	Average Duration of each Case of Sickness.
				In the Command.	Invalids.	Total.			Admissions.	Deaths.	Invalided.	Average daily Sick.		
Hong Kong	-	1,114	987	17	1	18	44	41·70	885·9	16·16	39·50	37·43	Days. 13·06	Days. 15·42
Straits Settlements.		1,074	1,467	7	—	7	46	32·27	1,045·9	6·52	41·90	48·67	17·76	13·01

In the Hong Kong division of the Command an increase is observed in admission rate, equal to 26·2 per 1,000, and one in the death rate, equal to 7·69 per 1,000; there is, however, a decline in the ratio of invaliding, and in that of constantly sick, as compared with corresponding ratios in the preceding year. The average sick time to each soldier, as well as the average duration of each case of sickness, are also shorter. In the Straits Settlements there was a considerable increase in admission rate, equal to 248·2 per 1,000; also an increase in the mortality and invaliding rates, 1·12 and 10·58 per 1,000 respectively, as

which 6 were cases of phthisis pulmonalis; 5 at Hong Kong, with one death, and one case at Singapore. A second death from this disease took place in an invalid on passage home. *China and Straits Settlements.*

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused an admission rate of 16·9 per 1,000, which, though slightly lower than in the preceding year, is about the same as the average rate. Neuralgic affections were the most prevalent diseases, and amongst the remainder were two of mental disease, one of somnambulism (admitted twice), and three cases of sun-stroke, one of which was fatal at Tanglin. *Ophthalmic affections* caused a rate of admission of 16·4 per 1,000, somewhat above the average; but the majority of the cases were of a simple character. Thirty-seven admissions are returned for *diseases of the circulatory system*, of which 25 were cases of palpitation and 8 valve disease of the heart; one death occurred from the latter at Singapore. The ratio of admission, 16·9 per 1,000, has declined from that in 1884, and is below the average rate. *Respiratory diseases* were at the rate of 24·7 per 1,000 for admission; being below that in the preceding year and the average by 8·0 and 14·7 per 1,000 respectively. Out of the total number of cases, 54, there were 45 of bronchial affections, 6 of asthma, 2 of pleurisy, and one of pneumonic phthisis.

*Diseases of the Digestive System* caused 285 admissions, equal to a ratio of 130·3 per 1,000, which, though below the average ratio for the preceding six years by 18·5, is slightly above that of the preceding year. The principal causes of admission were diarrhoea 100 cases, dyspepsia 53, hepatic affections 32, tonsillitis 26, and dysentery 10. Of the cases of diarrhoea, 61 were at Hong Kong, where the disease was very prevalent in the spring, and during the outbreak of cholera. Two deaths are recorded, both from enteritis, at Hong Kong. Among 209 admissions for *urinary affections*, gonorrhoea and its sequelae accounts for 175, or 80·0 per 1,000, which rate is below the average by 23·5, and that of the preceding year by 10·6 per 1,000; the admissions for other urinary disorders were at the rate of 15·5 per 1,000; the cases included one of Bright's disease, one of calculus, and six of stricture of urethra. *Affections of the generative system and organs of locomotion* call for no remark, but with regard to those of the *cellular tissue* it is stated that there is a considerable increase as compared with the previous year, the admission rate, 42·0 per 1,000, being higher by 17·3. In this comparison also *cutaneous affections* show a marked increase, the admission rate being 117·9 as compared with 72·4 per 1,000, and is greater than the average rate by 52·6 per 1,000. The cases of boil, ulcer, and tinea tonsurans contributed chiefly to this result. Of the last-named affection there were a considerable number of cases in the 2nd East Kent Regiment, and it was believed that the disease was propagated by the washermen.

The admission rate for *debility*, 18·3 per 1,000, shows a great decline, and is less than half of the average rate and the rate in the preceding year. Most of the cases occurred at Hong Kong. "In cases following fever change to the sanitarium was beneficial, but if malarial cachexia was established a complete change of climate was necessary to restore health."

Thirty-two admissions under the head of *poisons* are recorded; of these, 6 were cases of delirium tremens, and 26 of alcoholic poisoning, and from the latter there was one death. No other cases of poisoning occurred.

**Injuries.**—One death from drowning occurred at Tanglin; the man was found dead in the swimming bath, and is supposed to have been seized with cramp while bathing. 256 admissions for local injuries are recorded, chiefly contusions, wounds, and sprains, &c. There was one case at Hong Kong of injury to the spinal cord, of a serious nature, in a man who jumped through a window and fell a distance of 40 feet on to the hard ground. He eventually recovered sufficiently to walk a short distance, and was invalided.

On account of a gun-shot wound of the hand from the bursting of a shell, the second and third fingers and part of the palm of the hand were removed, and the little finger brought close to the index finger; the case did well and a very useful hand resulted. An operation was also performed for the removal of necrosed bone from the pelvis, resulting from injury, with ultimate satisfactory result.

**Invaliding.**—The number of men invalided home during the year was 89, and of men finally discharged the service 48, including one man discharged

*China and  
Straits  
Settlements.*

in Hong Kong, being in the ratios of 40·22 and 21·94 per 1,000 respectively. Compared with corresponding rates in the preceding year, there is an increase of 1·99 in that of invaliding home, and one of 7·86 in that of final discharge; and in comparison with the average similar rates for the preceding ten years, the invaliding rate has decreased by 1·79, but that of final discharge has increased by 4·94 per 1,000. The principal causes of invaliding were phthisis pulmonalis 10 cases; secondary syphilis 4; nervous affections 6, including one case of mental disease; diseases of the circulatory system 13, including 9 cases of valve disease of the heart; disorders of the digestive system 12, among which were 6 cases of hepatic disease; debility 21, and injuries 3. The chief disabilities causing final discharge were phthisis pulmonalis 7 cases, secondary syphilis 1, mania 1, ophthalmic affections 5, deafness 3, diseases of the circulatory system 9, including 5 of heart disease, bronchitis 4, digestive disorders 4, affections of the organs of locomotion 2, debility 8, and injury 2 cases.

*Officers.*—The average strength was 91; the attacks of illness numbered 59, the deaths 2, and those invalided 10. The rate of prevalence of sickness, 648·4 per 1,000, shows an increase of 263·8, and the rates of mortality and invaliding 21·98 and 109·88 per 1,000, are exactly double the corresponding rates in the previous year. The prevailing diseases were fevers and disorders of the digestive system. Among the former were one case of enteric fever and two of remittent fever, and among the latter were four cases of dysentery and two of hepatic disease, one of which, a case of abscess of the liver, proved fatal. The second death was caused by hydrophobia. The officer had been bitten by a rabid dog some months previously at Tanglin, but so slightly, the injury being only a scratch, that he did not think it necessary to have it cauterised. A report of the case will be found in the Appendix to the last Departmental Volume. The causes of invaliding were debility 4 cases, dysentery 2, and enteric fever, ague, enteritis, and renal disease one case respectively.

*Women.*—Sixty-seven attacks of illness and one death are recorded in an average strength of 75 women, the ratio of attack being 848·1 per 1,000, and that of mortality 12·66, as compared with 917·8 per 1,000, and *nil* in the preceding year. Among the cases were 14 of fevers, 3 being remittent fever, one of which ended fatally, 14 of diarrhoea, 11 of debility, and 9 of abortion.

*Children.*—The average strength of children was 124; the number of cases treated 53, and the number of deaths 10. The ratios of attack and mortality, 427·4 and 80·65 per 1,000, exceed the corresponding ratios in the preceding year by 19·1 and 22·32 per 1,000 respectively. The principal causes of illness were fevers, disorders of the digestive system, and bronchial affections. The deaths were due to convulsions in three instances, to tabes mesenterica in two, diarrhoea in two, and to meningitis, sunstroke, and asphyxia by drowning in one case respectively.

*Sanitary Conditions.*—The Principal Medical Officer remarks that “the improvement in health noted last year from the drainage of the rifle range at Tanglin has not been permanent, owing to the fact that the portion of ground drained was very small and quite insignificant when taken in connexion with the large expanse of marsh and swamp, extending to a distance of 4 to 5 miles. The swamp is more extensive than in former years owing to the damming up of the water courses for purposes of cultivation.”

With regard to barrack accommodation, it is reported that very slight overcrowding occurred at Hong Kong, and about 60 men were, therefore, under canvas at Kowloon. In the Straits Settlements accommodation was insufficient owing to an increase in the garrison; a temporary mat shed was therefore erected, and two new bungalows have been sanctioned. Ventilation, warming, and lighting appear to have been satisfactory at all stations.

The drainage at Hong Kong is said to be fairly good in cantonments, but the sanitary condition of the neighbourhood of the barracks is stated to require improvement. At Tanglin drainage works are reported to be still in progress. Latrine accommodation is reported as fairly satisfactory, and at Tanglin it is proposed to introduce the dry earth system.

Concerning water supply, it is reported that at Hong Kong it is of good quality, and has been sufficient, but in the dry season a larger supply would be desirable. At Tanglin some complaint was recently made of the water, and

arrangements were made for its analysis. At Penang water is excellent and abundant. *China and Straits Settlements.*

With regard to hospital accommodation the Principal Medical Officer states, that for Hong Kong he has recommended that "a site on shore should be fixed upon for a military hospital, and should be retained for the purpose of its erection when this becomes unavoidable." He is of opinion that "the choice should be made at once, and the site levelled so as to avoid putting men into a building erected on ground recently opened out which has already been productive of ill effects at the sanitarium."

A hospital for women and children is said to be much required, and a recommendation for its provision has been put forward.

---

## II.—ASIATIC TROOPS.

The Asiatic troops in the Command consist of the head-quarters and two companies of Gun Lascars stationed at Hong Kong, and a detachment of 15 men at Fort Canning, Singapore. The average strength was 188; there were 208 admissions into hospital, 8 deaths, and five men were invalided, being in the ratios of 1106·4, 42·56, and 26·59 per 1,000 respectively, the two former showing an increase, but the latter a decrease, on the corresponding ratios in the preceding year. The principal cause of illness is malarial fever, 82 of the admissions being due to this cause.

Diseases of the digestive system (principally diarrhœa) caused 27 admissions, respiratory affections 20, and injuries 25 admissions. The deaths were due to remittent fever, rheumatism, apoplexy, heart disease, bronchitis, pneumonia, diarrhœa, and delirium tremens, one case respectively. The causes of invaliding were debility in three instances, and synovitis and emphysema, each in one instance.

---



## XII.—ON THE HEALTH OF THE TROOPS SERVING IN INDIA.

*Sickness and Mortality.*

The average strength of the warrant officers, non-commissioned officers, and men in India was 57,165; the admissions into hospital were 87,000; and the deaths 868, of which 834 took place in India, and 34 (being those of invalids) on the passage to or after arrival in England. The average number of constantly sick was 4034·82. The rates from these numbers are, for admissions 1521·9, for deaths 15·18, and for constantly sick 70·58 per 1,000 of the strength.

The sickness for each of the three commands is shown in the following table:—

—	Average Annual Strength.	Admitted into Hospital.	Deaths.			Inva- lids sent Home.	Inva- lids dis- charged the Service.	Con- stantly sick.
			In India.	Of In- valids.	Total.			
Bengal - -	35,101	57,890	457	21	478	714	483	2508·24
Madras - -	10,414	12,105	97	5	102	251	145	686·02
Bombay - -	11,650	17,005	280	8	288	338	140	780·56
Total - -	57,165	87,000	834	34	868	1,303	768	4034·82
Ten years, 1875 } —84 - - - }	558,962	828,896	9,128	617	9,745	21,639	9,309	35316·00

*continued.*

—	Ratio per 1,000 of Mean Strength.					Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
	Ad- mitted.	Died.	Inva- lided Home.	Inva- lids dis- charged.	Con- stantly sick.		
Bengal - -	1649·2	13·61	20·34	13·76	73·17	Days. 26·70	Days. 16·19
Madras - -	1162·4	9·79	24·10	13·93	65·87	24·04	20·68
Bombay - -	1459·6	24·72	29·01	12·02	67·00	24·45	10·75
Total - -	1521·9	15·18	22·79	13·43	70·58	25·76	16·93
Ten years, 1875 } —84 - - - }	1482·9	17·43	38·71	16·65	63·18	23·06	15·55

## I.—BENGAL.

The average strength of warrant officers, non-commissioned officers, and men serving in the command during the year was 35,101; the admissions into hospital numbered 57,890; there were 478 deaths, including those of 21 invalids, who died either on passage home or after arrival in England; and the number constantly sick was 2568·24. The ratio of admission was, therefore, 1649·2 per 1,000, that of mortality 13·61, and that of constantly sick 73·17 per 1,000. Compared with the corresponding rates for the preceding year, an increase, though not to any extent, is observed in all, being 4·6 per 1,000 in admission rate, 1·51 in death rate, and 2·31 per 1,000 in constantly sick rate. In comparison with similar average rates for the preceding 10 years an increase of 96·0 per 1,000 is observed in the ratio of admission, and one of 8·27 in the ratio of constant inefficiency through sickness, but there is a decline of 4·87 per 1,000 in the ratio of mortality. The average sick time to each soldier was 26·70 days, and the average duration of each case of sickness 16·19 days, which are fractionally longer than the corresponding periods in the previous year, and longer than their average length in the preceding 10 years, the former by 3·01 days and the latter by ·94 days.

The total loss for the year by death and final discharge from the army as medically unfit for further service was 961 men, equal to a ratio of 27·37 per 1,000, which is less than that for the preceding year by ·33 per 1,000.

With reference to the increase in the amount of sickness as compared with the preceding year, the Principal Medical Officer, Surgeon-General C. D. Madden, states that it was principally due to the increased prevalence of venereal affections; indeed, it will be observed that had it not been for this increment the ratio of admission would have shown a considerable decline.

The sickness and mortality in the different stations in the command are shown in Abstract XV. in a table taken from the report of the Principal Medical Officer. With regard to the different circles of administration, it is observed that the highest ratio of admission was 2422·5 per 1,000 in the Meerut circle, followed by 2200·4 per 1,000 in Lahore, and 1813·6 per 1,000 in Gwalior, while the lowest ratio, 1258·1 per 1,000, is found in the Rawal Pindi circle, Saugor and Oudh being next above with 1398·9 and 1408·2 per 1,000 respectively. Increase of admission rate as compared with the preceding year occurred in the Presidency, Allahabad, Oudh, Rohilcund, Meerut, and Sirhind circles, and decrease in the Saugor, Gwalior, Lahore, Rawal Pindi, and Peshawar circles. The greatest increase was 452·4 per 1,000 in the Meerut division, owing to the great prevalence of malarial fever, and the least, 15·0 per 1,000, in the Sirhind circle; the greatest decrease was 532·1 per 1,000 in the Peshawar circle, and the least, 63·0, in that of Saugor. The highest rate of mortality in any circle was 17·53 per 1,000 in Meerut, Allahabad being next with 17·28; the lowest rate, 9·45 per 1,000, was in Rohilcund, next above being Gwalior with 11·08. With the exception of Rohilcund and Gwalior, mortality rates increased in all the different districts, the increase varying from 7·94 per 1,000 in the Sirhind circle to ·01 in that of Allahabad.

As in the preceding year, and from the same cause, the prevalence of malarial fever, the highest ratio of admission in any station occurred in Delhi, and reached 4155·8 per 1,000, which is considerably above the decennial average rate, though it compares somewhat favourably with the rate in the preceding year. Omitting hill stations and garrisons whose average strength was less than 150 men, the following stations come next among those with high rates of prevalence of sickness; Muttra, 2971·3 per 1,000, more than double the decennial average rate, and also the last year's rate, through the great prevalence of malarial fever; Ferozepore, 2661·1 per 1,000, principally due to ague; and Roorkee, 2517·2 per 1,000; both the latter stations show increased prevalence of sickness as compared with the rates in the preceding year as well as with decennial average rates. Among stations in the plains having comparatively low ratios of prevalence of sickness may be mentioned Rawal Pindi, 1110·3 per 1,000; Cawnpore, 1121·9; and Saugor, 1119·8 per 1,000; all of which are below the average ratios for these stations, and the last named only is above the ratio in the preceding year. The prevalence of

*Bengal.*

sickness in the Peshawar valley declined a good deal during the year, the ratio of admission at Peshawar, 1818·6, being below the average and the previous year's rates by 709·6 and 771·7 per 1,000, and that at Nowshera, 1387·3, lower than the corresponding ratios by 364·9 and 451·0 per 1,000 respectively.

Among hill stations the admission ratios vary considerably, some being high, such as Kasauli, 3302·8 per 1,000, and Dalhousie, 2296·5 per 1,000, owing to convalescents being sent up for treatment, and some being low, such as Ranikhet, 1015·2, and Subathu, 1097·2 per 1,000. In the majority of the hill stations it is observed that the admission ratios are rather above the average. With regard to mortality, the highest ratio occurred at Muttra, and was 41·78 per 1,000, being, like the admission rate for this station, more than double the average rate and also double that for the previous year; this was partly due to the occurrence of 8 deaths from enteric fever and 2 from cholera. Among other stations with high mortality ratios may be mentioned Delhi, with 25·97 per 1,000; Benares, 24·59; and Sitapur, 24·21 per 1,000; all of which are higher than in the previous year, and, with the exception of Benares, above the average rates. The lowest mortality of stations in the plains, excepting two where no death occurred, was 2·67 per 1,000 at Saugor, which compares very favourably with previous and with average rates. Next above comes Fort Allahabad, with 4·69 per 1,000, and Fyzabad, with 6·49 per 1,000. Among hill stations mortality rates varied from 26·32 per 1,000 at Landour to 3·37 per 1,000 at Ranikhet, and *nil* at some others.

The more important of the health statistics of the arms of the service, as well as of the different corps which served in the command during the year, will be found in a table given in Abstract XLIII. and taken from the report of the Principal Medical Officer.

The average strength of cavalry was 2,469, and the ratio of admission in this arm of the service was 1961·9 per 1,000, that of death 17·01, and that of constant inefficiency through sickness 83·09 per 1,000. Compared with corresponding rates in the previous year an increase is observed in each of these ratios, amounting to 166·7 per 1,000 in the case of admission, to 7·28 in that of mortality, and to 8·96 in that of constantly sick. The average duration of each case of sickness as well as the sick time to each soldier are also longer than in the preceding year. In the artillery the average strength was 5,587, and the admission ratio was 1750·7 per 1,000, which shows a decline as compared with the corresponding rate for the previous year equal to 87·8 per 1,000; the death rate, 10·67 per 1,000, has also declined considerably, being less than half of that recorded in 1884. The constantly sick ratio, however, 79·90 per 1,000, shows a slight increase, as also do the average sick time to each soldier and mean duration of sickness. In the infantry, the average strength of which was 25,639, there was an admission rate of 1634·8, a mortality rate of 12·52, and a constantly sick rate of 71·05 per 1,000; all these are increased as compared with corresponding rates in the previous year; the admission and constantly sick rates, however, only very slightly, but that of mortality by 3·28 per 1,000. There was a slight increase in the length of sick time to each soldier, but scarcely any change in the duration of each case of sickness.

In the cavalry the regiment showing the highest ratios of admission and mortality was the 3rd Dragoon Guards quartered at Muttra, being 2817·5 and 38·93 per 1,000 respectively; the lowest admission rate was 1122·3 per 1,000 in the 1st Dragoon Guards at Rawal Pindi, and the least mortality was 7·03 per 1,000 in the 6th Dragoon Guards at Sialkot; the highest rate of inefficiency through sickness was 109·22 per 1,000 in the 8th Hussars at Meerut, and the lowest, 62·73 per 1,000, in the 1st Dragoon Guards.

In the artillery there is considerable variation in the rates of prevalence and sickness in the different troops and batteries (which were 45 in number) on account of the small average strength in many instances. The highest admission rate in an individual battery was 3979·2 per 1,000 in the 9th Battery, 1st Brigade, Eastern Division, quartered at Delhi. In the preceding year also this battery gave the highest admission ratio. Among other batteries with high prevalence ratios were F Battery, 4th Brigade, at Morar, 2783·8 per 1,000, and N Battery, 3rd Brigade, at Meean Meer, 2698·0 per 1,000. The lowest rate of prevalence occurred in the 1st Battery, 1st Brigade, London Division,

quartered at Campbellpore, and was 965·9 per 1,000. Mortality ranged from *Bengal*. 38·71 per 1,000 in G Battery 4th Brigade, at Allahabad, to *nil* in several batteries. Inefficiency on account of sickness gave the highest rate, 129·55 per 1,000, in the 8th Battery, 1st Brigade, Northern Division, and the lowest in B Battery, 2nd Brigade, 31·78 per 1,000 at Jullundur.

In the infantry, the average strength of which was 25,639, the highest admission rate occurred in a wing of the 1st Suffolk Regiment stationed at Delhi, and was 4390·0 per 1,000. This is followed by 2901·3 per 1,000 in the 1st Battalion East Lancashire Regiment quartered at Ferozepore. The lowest ratio of admission was 998·5 per 1,000 in the 1st Battalion East Surrey Regiment at Ranikhet (but this corps was not the whole year in the country), and next above it was 1066·0 per 1,000 in the 1st Battalion Royal Irish Fusiliers. The highest mortality was 25·07 per 1,000 in the wing of the 1st Suffolk Regiment, and the lowest 2·30 per 1,000 in the 2nd Battalion Devonshire Regiment quartered at Jhansi. The King's Own Borderers at Meerut showed the highest rate of inefficiency through sickness, 119·02 per 1,000 and the lowest, 45·64 per 1,000, in the 2nd Battalion Cheshire Regiment.

The admissions, deaths, invaliding, &c. in the different classes and orders of diseases are shown in Abstract XIV., and the prevalence of sickness and mortality from the various orders of diseases in each of the military divisions of the command are given in Abstract XVI.

**GENERAL DISEASES.**—The ratio of admission for this class of diseases amounted to 856·4 per 1,000, the ratio of mortality was 7·26, and of constantly sick 34·05 per 1,000. The admission ratio is almost identical with that in the preceding year, the death rate has increased by ·59, and the constantly sick rate by 1·74 per 1,000. In comparison with corresponding rates for the preceding 10 years, a decline of 38·6 per 1,000 is observed in admission rate, and one of 2·04 in mortality, but there is an increase of 2·77 per 1,000 in the constantly sick rate.

*Diseases of the Febrile Group* caused 22,609 admissions, 209 deaths, and 668·40 men were constantly ineffective on account of them. The ratios per 1,000, therefore, equalled 644·1, 5·95, and 19·04 respectively. Compared with corresponding rates for the preceding year, there is an increase of ·61 per 1,000 in mortality, but a decrease of 49·2 in admission rate, and one of ·97 per 1,000 in constantly sick rate. In comparison with average similar rates for the previous six years the decrease in admission rate equals 88·9, and in the death rate 1·74 per 1,000, and compared with the average for four years there is a fractional decrease in the rate of constant inefficiency.

The highest ratio of prevalence of febrile affections in any of the administrative circles was 1323·3 per 1,000 in that of Meerut, being followed by 1189·6 and 784·3 per 1,000 in the Lahore and Gwalior circles respectively. The lowest ratio was in the Rawal Pindi circle, 242·5 per 1,000; the Saugor circle, 410·8, and that of Rohilkund, 443·0 per 1,000, being next above. Compared with the returns for the previous year, increase of prevalence of febrile affections is observed in the Meerut, Oudh, Rohilkund, Presidency, and Allahabad districts; the greatest increase, 306·0 per 1,000, being in the first-named circle, and the least, 44·3, in the last. In all the remaining circles decrease of prevalence has occurred, varying from 396·5 in the Lahore circle to 46·4 per 1,000 in Sirhind. In the Peshawar and Gwalior districts a considerable decrease of prevalence is observed, in the former case amounting to 391·8, and in the latter to 349·4 per 1,000. With regard to mortality from febrile diseases, the highest ratio, 10·76 per 1,000, occurred in the Allahabad circle, the next being 8·06 in Gwalior; the lowest ratio was 2·81 per 1,000 in the Saugor district, Rohilkund being next above with 3·15. Mortality increased in the Allahabad, Oudh, Saugor, Meerut, Sirhind, Lahore, and Peshawar circles, but decreased in the remainder. The highest increase equalled 5·08 per 1,000 in the Peshawar district, and the greatest decrease, 7·61, in Gwalior.

*Eruptive Fevers* caused 747 admissions, equal to a ratio of 21·3 per 1,000 as compared with an average ratio of 2·9 in the preceding six years, and with 2·3, the rate in the preceding year. This great increase is entirely due to the prevalence of dengue, which alone caused 726 of the admissions. Small-pox caused 5 admissions and no deaths, as compared with 50 and 6 deaths in the preceding year. Two of the cases occurred at Dinapore, two at Fort Lahore.

*Bengal.*

and one on the march from Rawal Pindi. Measles caused 15 admissions, 4 cases at Cawnpore, 4 on the march, 2 at Ranikhet, 2 at Dinapore, and one at Allahabad, Calcutta, and Lucknow respectively. The large number of cases of dengue were distributed as follows :—348 cases at Lucknow, 167 at Umballa, 142 at Calcutta, 64 at Fyzabad, 4 at Benares, and one occurred on the march. The disease was epidemic in Calcutta in June, July, and August. It is stated that the number of cases recorded does not fully represent the sickness caused by dengue, as many of the milder cases were not admitted into hospital; and the same remark is made regarding the outbreak at Fyzabad. With regard to the outbreak at Lucknow it is stated that the disease was probably imported from Calcutta. Of the cases at Umballa it is said they were mostly mild, though in a few a species of collapse occurred. The disease was epidemic in the latter part of the year.

*Enteric Fever* caused 486 admissions and 142 deaths, being in the ratios of 13·8 and 4·05 per 1,000 respectively, as compared with 12·5 and 3·29 per 1,000 in the preceding year, and with 8·5 and 3·05 per 1,000, the average of similar ratios for the previous six years. The per-centage of mortality to cases treated was 29·2, which has increased by 3·0 per cent. on the rate of the previous year, though it is still below that in 1883 by 1·4 per cent.

In Abstract XVII. there is a table taken from the report of the Principal Medical Officer, which shows the stations at which the admissions and deaths from this disease took place in each of the four quarters of the year. From this table it will be seen that the disease was most prevalent in the third quarter of the year, and next in the second (in which it differs from the previous year, when the positions were reversed), the last quarter follows next in prevalence, the first quarter being last. The greatest prevalence, therefore, was in the hot and rainy seasons, and the least in the cold season. The mortality to attacks was highest in the fourth quarter, being 39·0 per cent., next in the third, 31·5, followed by the second, 25·0, and then by the first quarter, 15·2 per cent. None of the circles of administration were free from the disease, and 48 stations, exclusive of camps of exercise, were attacked in varying degrees. As in the two preceding years the greatest incidence of the disease in any one station was at Lucknow. The cases numbered 55, among which were 10 deaths, equal to 18·1 per cent. Cases occurred in every month of the year, but in August and September the incidence was greatest. The medical officer in charge states that "in no instance could the disease be traced to insanitation or to faults in connexion with food or water, although it would be rash to assert positively that in a country where the latter is entirely furnished by wells the possibility of contamination should be excluded." Of the total number of cases, 42 were under the age of 25 years, and the same number were under 3 year's service in India. One of the cases occurred in the military prison, the man had been one month in prison when attacked, no cause for it could be detected, either in sanitary conditions, or water or food supplies. At Morar 30 attacks and 11 deaths occurred. Of the cases 14 happened in August and September, half of which proved fatal. The medical officer in charge states that "the type of the disease is always bad in these months. As usual most of the cases occurred in young soldiers lately arrived in India; the average age of all the cases was 22 years, and 23 of the men attacked had only served one year or under in the country. The cases were distributed all over the barracks, the greatest number in one barrack was 4, but these cases were separated by intervals of time of some length." It was not possible to assign any cause for the disease; no sanitary defects of any importance were observed, the milk and water supplies were carefully attended to, and the prevalence of the disease, in the opinion of the medical officer, could only be attributed to climatic causes and to individual susceptibility. At Cherat this disease prevailed to a greater extent than in any previous year, the number of attacks being 34, among which were 8 fatal cases; the disease, however, has been gradually on the increase from year to year. With regard to the causation of the disease, the medical officer in charge in a report on the subject points out that while the water supply is absolutely pure at its source, some risk of contamination occurs in the means by which it is distributed, the packals, or skins, in which it is carried; the latrine arrangements also are said to be defective, and this condition, together with suggestions for improvement in the method of removal of excreta, is brought to

notice. 24 of the cases, with 6 deaths, occurred in the third quarter *Bengal*. of the year, 10 in July, 5 in August, and 9 in September; with regard to the time of occurrence of enteric fever in this station, however, it must be remembered that the bulk of the troops only arrive from the plains in May and return in November. The average age of the men attacked was 22½ years, their average total service under three years, and average residence in India under two years. At Sitapur there were 28 cases and 10 deaths. Cases occurred in every month of the year, except January and August, and every barrack furnished cases. The largest number from any single building was 7, and of these 5 occurred in the month of April within short periods of each other; these were attributed to an insanitary condition which was discovered to exist in a corner of this particular barrack. Various suggestions were made as to the exciting causes of other cases. 11 cases out of one draft from home occurred, and, of the remaining cases, the men attacked were mostly young soldiers with short Indian service. The same remark applies to 25 cases which occurred at Fyzabad, the greater number being in young soldiers. The disease prevailed throughout the year, except in February and October. The causation of the cases was difficult to determine, but one or two minor sanitary defects are mentioned. Mortality was less than at other stations previously noticed, only three deaths having occurred. At Meerut there were 22 attacks and 9 deaths, 10 of the cases occurring in the second quarter of the year and 6 in the third and fourth respectively. At Rawal Pindi there were 21 cases and 10 deaths, of these it is said the origin could not be traced; the cases occurred in all four quarters of the year, though most in the second quarter. At Allahabad there were 20 attacks and 6 deaths, chiefly in the second and third quarters of the year; the average age of the men attacked is given as 23, and their average service under a year and a half. The cases were distributed over many different buildings. At Muttra there were 16 attacks, of which half were fatal, at Meerut 18 with 6 deaths, and at Cawnpore 12 cases and 8 deaths. Youth and short service in the country is alluded to with regard to the occurrence of these cases, but concerning 12 cases with 6 deaths at Subathu it is stated that in two or three of them the ages were higher than usual, though all were under a year's service in India. Of 12 cases which occurred in Umballa, two being fatal, it is said that 6 of them had recently returned from a camp of exercise. 11 cases occurred at Jubbulpore and Ranikhet respectively, the deaths being 2 in the former and 1 in the latter. No cause could be determined for the disease in either place, though, as regards Ranikhet, various suggestions were made for the occurrence of several of the cases. At Chaubuttia, Dagshai, and Mooltan there were 10 attacks respectively, the deaths being 2 in the first instance, and 3 each in the other two. Of the cases at Chaubuttia, it is stated that most were contracted before arrival at the station. Many other stations returned cases with single numbers, among which are Peshawar, 9 cases and 5 deaths; Jullundur, 9 and 2 deaths; Dinapore, 8 and 4 deaths; Agra, 8 cases and 1 death, &c. These and other cases cannot be referred to in detail, but in very many of them similar remarks to those quoted above occur regarding the liability to attack of young soldiers recently arrived in the country; and in most cases it is stated that nothing definite could be ascertained concerning their etiology.

*Other Continued Fevers* caused 3,348 admissions and 3 deaths, being in the ratios of 95·4 and ·08 per 1,000. The ratio of admission has declined by 14·1 from the ratio in the preceding year, and is below the mean rate for the preceding six years by 39·0 per 1,000. Of the admissions, those for febricula and simple continued fever were very nearly in the proportions of 2 to 1; there were three admissions and one death from cerebro-spinal fever, two of which occurred at Nowshera, and the third on the march from that place to Cherat. The other two deaths occurred at Dum Dum from simple continued fever. Continued fevers taken together show the highest ratio of prevalence, 261·4 per 1,000, in the Allahabad circle, followed by 206·3 in the Peshawar circle, and by 149·1 in that of Gwalior; while the lowest ratio, 41·4 per 1,000, is found in the Saugor division, the Meerut and Peshawar circles being next above with 54·0 and 57·2 per 1,000 respectively. Compared with the returns for the preceding year, increase of prevalence of continued fevers has occurred in the Allahabad circle, the increment being 113·9 per 1,000;

*Bengal.*

there is also increase observed in the Presidency, Oudh, and Meerut circles, but in each case to a less extent. In Rohilcund there was only a fractional increase, and in all other circles a decrease of prevalence occurred, varying from 160.9 per 1,000 in the Gwalior district to 11.8 in the Sirhind division.

*Paroxysmal Fevers* caused 17,896 admissions and 19 deaths, being in the ratios of 509.9 and .54 per 1,000 respectively. The ratio of admission has declined by 54.4 per 1,000 as compared with that in the previous year, and by 69.2 as compared with the mean rate of the preceding six years. The ratio of constant inefficiency on account of these fevers was 13.75 per 1,000, which is almost identical with the average ratio, though below the rate in the previous year by 1.01 per 1,000. Mortality, on the other hand, was rather higher than in 1884, but a good deal below the average. Among the different circles it is observed that the greatest prevalence of malarial fevers was in the Meerut division, the ratio per 1,000 of strength amounting to 1263.3 per 1,000, followed by the Lahore circle with 1091.6, and that of Gwalior with 632.2 per 1,000. Compared with the corresponding ratios in the preceding year, that for the Meerut division has increased by 305.5 per 1,000, but those for Lahore and Gwalior have declined by 321.8 and 187.1 per 1,000 respectively. The circles least affected by malarious fevers were Rawal Pindi, where the rate of prevalence was only 182.7 per 1,000; Oudh, 221.6; and Allahabad, 240.9 per 1,000. Compared with the preceding year, the ratio for Oudh shows an increase of 107.4 per 1,000, and those for the Rawal Pindi and Allahabad circles a decrease of 99.3 and 60.5 per 1,000 respectively. The ratios of prevalence of these fevers in the Peshawur and Saugor divisions, 428.1 and 366.6 per 1,000, have also declined considerably, by 313.5 and 212.4 per 1,000 respectively. In the Presidency and Rohilcund, on the other hand, the ratios, 288.4 and 347.6 per 1,000, have increased a good deal, the former by 109.3 and the latter by 211.2 per 1,000. 369 of the admissions were due to remittent fever, and the remainder to ague; there were 17 deaths from the former and 2 from the latter. Among the cases of remittent fever were 75 with 2 deaths at Mean Meer, 24 at Cawnpore, 23 at Sialkot, 17 at Lucknow with one death, 16 (one case fatal) at Umballa, 16 at Cherat, 15 at Rawal Pindi, 13 at Barrackpore, 12 at Muttra, &c. Two deaths occurred from this disease at Dinapore, Dum Dum, and Peshawar respectively, and one death each at Agra, Benares, Chakrata, Jullundur, Jutogh, Pachmarhi, and Meerut. Two deaths are recorded from ague, one at Peshawar and the other at Jutogh. Cases of ague were very numerous at Meerut during the year, 2,078 being recorded; Ferozepore and Delhi also gave a considerable number of admissions, 1,277 and 1,510 respectively.

*Cholera* caused 61 admissions and 37 deaths, being in the ratios of 1.7 and 1.05 per 1,000 respectively, as compared with 2.1 and 1.33 per 1,000 in the preceding year, when the cases were 71 and deaths 45. The ratios of prevalence and mortality compare favorably with the corresponding mean rates for the preceding six years, which are 4.2 and 3.10 per 1,000 respectively. In Abstract XVIII. is given a table taken from the report of the Principal Medical Officer, showing the stations in the command at which the admissions and deaths from cholera took place in each of the four quarters of the year. It will be observed that, as in the previous year, the greatest prevalence and mortality from the disease was in the third quarter of the year, 36 cases and 22 deaths, followed by the second quarter with 15 cases and 11 deaths, the fourth quarter with 7 cases and 4 deaths, and, lastly, the first quarter with 3 cases, recoveries. The ratio of mortality to attacks was 60.6 per cent., slightly lower than in the preceding year, when it was 63.4 per cent. All the districts except Rohilcund were affected in some degree, and the number of stations at which the disease appeared was 17. At no single station did a great number of cases occur, the highest being 7, of which one was fatal, at Lucknow. It is said that nothing definite could be traced as the cause of these cases. At Allahabad there were 6 cases and 3 deaths; they occurred in August, but the disease had been epidemic among the civil population for some time previously. Five of the cases occurred in three days, but the troops marched out and the disease ceased. At Fortress Gwalior there were 5 attacks, all fatal; the disease was very prevalent in the city and district at the time. At Rawal Pindi and also at Fort William there were 5 cases and 4 deaths; in the former instance the disease occurred in July and August, but it had been prevalent in the city and

bazaars for some two months before. At Cawnpore there were 4 cases and 3 *Bengal* deaths; of these one case occurred in May, and the remainder in October, when the disease was prevalent among civil population. At Mooltan also there were 4 cases and 3 deaths; concerning these it is said that the disease was probably imported, it being very prevalent along the valley of the Indus. At Muttra also the same number of admissions and deaths were recorded. At Agra 4 sporadic cases occurred, two of which proved fatal. At Benares and Dinapore there were 3 cases respectively, with 2 deaths at the former and one at the latter station; at both places the cases are said to have been of a sporadic character, and to have occurred at different periods. At Nowshera there were 2 cases, both fatal; the disease was not known to exist in the district; the second of the cases occurred in a man who had been an attendant on the first. At Fatehgarh there were also two fatal cases, but the disease in this instance was prevalent in the neighbourhood. At Fyzabad and Kasauli there were two cases respectively; none of them proved fatal. Single fatal cases occurred at Saugor and Barrackpore, and one man, who recovered, was attacked by the disease on the march.

Among other diseases of the febrile group there were 71 admissions and 8 deaths. Erysipelas caused 52 admissions and 2 deaths, as compared with 77 cases and 4 deaths in the preceding year. Four cases of pyæmia are recorded, one at Lucknow, Muttra, Agra, and Ranikhet respectively; all of these proved fatal. Diphtheria caused 5 admissions at Landour, of which 2 proved fatal. It is stated that no cause could be ascertained for the original outbreak of the disease, and there was no diphtheria present in the station at the time. All the cases occurred in very weakly men.

*Diseases of the Constitutional Group.*—7,452 admissions and 46 deaths, including 11 of invalids, are recorded under this head, being in the ratios of 212·3 and 1·31 per 1,000 respectively, as compared with 163·2 and 1·33 per 1,000 in the preceding year, and 162·0 and 1·61 per 1,000, the average ratios for the previous six years. In both these comparisons it will be observed that there is a considerable increase of admission rate, which appears to be almost entirely due to the greater prevalence of syphilitic affections.

The various forms of *rheumatism* caused 1,231 admissions and 3 deaths, being in the respective ratios of 35·1 and ·08 per 1,000. The ratio of admission differs only fractionally from that in the preceding year, but is below the average rate of the previous six years by 2·4 per 1,000. The greatest prevalence of rheumatic affections was in the Peshawar district, the ratio per 1,000 being 49·8; the Sirhind and Meerut districts are next in prevalence, their ratios being 40·3 and 40·2 per 1,000 respectively; the lowest ratios of prevalence were 25·3 in the Saugor district, and 28·8 and 29·7 per 1,000 in Rohilcund and Oudh. Compared with the preceding year the Peshawar and Saugor districts show a considerable increase, and the Presidency circle a similar decrease in the ratios of prevalence of rheumatism. With regard to the remaining circles no great difference is observed. Out of the total number of admissions 212 were cases of rheumatic fever, which also caused all the deaths.

*Primary syphilis* caused 4,539 admissions, and secondary syphilis 1,073, which are in the ratios of 129·3 and 30·6 per 1,000 respectively. Compared with the corresponding rates in the preceding year the admissions for primary syphilis have increased by 42·6 per 1,000, and compared with the average for the previous six years by 41·4. In similar comparisons the admissions for secondary disease have increased by 6·2, and 6·6 per 1,000 respectively. The average number constantly sick from primary syphilis in 1884 was 6·11 per 1,000 and the mean of the previous four years 6·41 per 1,000, but in the year under report rose to 8·67 per 1,000. Similarly the constant inefficiency on account of secondary disease, which equalled 1·98 as a mean rate and 2·18 in 1884, rose to 2·61 per 1,000 in 1885.

Among the different districts the highest rate of prevalence of primary disease was in the Rawal Pindj circle, the ratio per 1,000 being 201·5; the Allahabad and Presidency circles come next with 161·4 and 147·8 per 1,000 respectively; the lowest ratio of prevalence (as also in the previous year) was in Gwalior, 39·8 per 1,000; the next above being 83·9 in the Lahore circle, and 86·2 per 1,000 in that of Peshawar. Compared with the return for the previous year there was an increase of prevalence of primary syphilis in all the



*Bengal.*

districts except two, ranging from 87·8 per 1,000 in the Rohilcund circle to 1·7 in Lahore; in the Saugor and Gwalior divisions there was a decline of 32·2 and 5·5 per 1,000 respectively. The highest ratio of admission for secondary disease was 49·9 per 1,000 in the Saugor division, 48·1 and 38·1 in the Oudh and Allahabad circles, being next below; the lowest ratio was 16·8 per 1,000 in Peshawar, 17·6 in Gwalior, and 20·9 in the Lahore circle coming next above. In comparison with last year's report increase of prevalence of secondary disease is observed in all the districts except those of Lahore and Peshawar, where decrease equal to 1·1 and 6·8 per 1,000 respectively occurred; the increase varies from 18·1 per 1,000 in the Sirhind district to 4·6 per 1,000 in that of Saugor.

Including gonorrhœa and its sequelæ, the admission rate for all forms of venereal disease amounted to 330·6 per 1,000, which shows an increase of 70·0 per 1,000 on the corresponding rate in the preceding year, and one of 86·2 per 1,000 on the similar average rate for the preceding six years. The average number of men constantly ineffective on account of these affections was 800, equal to a rate of 22·78 per 1,000, which is higher than the average rate by 5·79 per 1,000, and than the corresponding rate in the preceding year by 4·09 per 1,000.

*Tubercular diseases* caused 211 admissions and 40 deaths, including 10 of invalids, which give ratios of 6·0 and 1·14 per 1,000 of strength respectively; both of these ratios show a decline as compared with mean rates, but in comparison with corresponding ratios in the preceding year the admission rate has decreased, while the mortality rate has slightly increased. The greatest prevalence of tubercular affections was in Rohilcund, the ratio being 9·5 per 1,000; this was followed by the Lahore circle with 9·1 per 1,000; the least prevalence was in Gwalior, 3·0 per 1,000, Peshawar being next above with 3·7 per 1,000. Of the total number of admissions 179 were due to phthisis pulmonalis, and 19 to tubercular hæmoptysis. Of the deaths 38 were due to phthisis pulmonalis, one to tubercular hæmoptysis, and one to tubercular meningitis.

*Scurvy* caused 112 admissions and purpura one; the ratio of admission for these diseases amounted to 3·2 per 1,000 as compared with 2·3 per 1,000 in the previous year, and with 1·3 the average rate. Forty of the cases occurred in the Meerut circle, and of these 32 at Roorkee, among the men of a draft recently from home; the outbreak was attributed to deficient vegetable ration on board ship; appropriate measures were adopted for its cure and prevention, including the issue of extra vegetables, and the disease soon disappeared. Seventeen cases occurred in the Lahore and Peshawar districts respectively, and the remaining admissions were scattered over seven districts. One death recorded as from scurvy took place at Benares.

There were 285 admissions for *other constitutional diseases*; of these 5 were cases of cancer, 3 of lupus, 2 of diabetes, 4 of general dropsy, and the remainder anæmia. The ratio of admission for these affections equalled 8·1 per 1,000, slightly above the rate in the preceding year, but nearly double the average ratio of the preceding six years. The comparatively high ratios in this and the preceding year were, it will be observed, almost entirely due to the number of cases returned as anæmia. There were two deaths from cancer, one in an invalid after having left the command.

**LOCAL DISEASES.**—*Diseases of the nervous system* caused 558 admissions and 41 deaths; the ratio of admission was, therefore, 15·9, and that of mortality 1·17 per 1,000. Compared with corresponding ratios in the preceding year a decrease of 3·6 per 1,000 has occurred in admission rate, and one of 1·6 in the death rate; and compared with similar mean ratios for the previous six years there is a decrease of 4·2 per 1,000 in the former and one of 1·08 in the latter. With regard to prevalence of these affections in different districts, the highest ratio occurred in that of Rawal Pindi, and was equal to 23·4 per 1,000, the Presidency following with 19·5; the lowest ratio, as in the preceding year, was 7·9 per 1,000 in the Saugor division, the Peshawar district, which in 1884 had the highest ratio of all, being next above, with only 11·9 per 1,000. The ratios in the remaining districts differ little from each other, and from the general ratio. Compared with the preceding year there is a marked decline in ratio in the Peshawar district, and to a less extent in the Gwalior, Allahabad, and Rohilcund districts; but in all the other districts the variations are slight. Mortality from these diseases varied from 2·09 per 1,000 in the Rawal Pindi

district to *nil* in that of Saugor. Compared with the previous year mortality increased in the Rawal Pindi, Sirhind, and Presidency circles, but decreased in the remainder, except the Saugor division, in which no death occurred in either year. Among the admissions were 80 cases of sunstroke and 26 deaths from it, as compared with 97 and 27 in the preceding year, and being in the ratios of 2·3 and 74 per 1,000 respectively. Sunstroke occurred at a great many stations, the largest number of cases being 7, with 4 deaths, at Rawal Pindi; 6 and 4 deaths at Peshawar, 6, all of which recovered, at Ferozepore, 5 and 2 deaths at Mooltan, 5 and 1 death at Lucknow, 4 cases and 2 deaths at Attock, 3 cases and 2 deaths at Sialkot, &c. The remaining deaths occurred singly at various stations. Apoplexy caused 8 admissions and 6 deaths, and meningitis 10 admissions and 5 deaths; there were also one fatal case of abscess of the brain, and three fatal cases of hydrophobia. Two of the cases of hydrophobia occurred at Dum Dum; both the sufferers were bitten by the same dog on the 25th December 1884, one being attacked by the disease on the 2nd March, and the other on the 24th March; the former dying on the 4th and the latter on the 25th. It is stated that several other men were bitten by the dog, but it is not known if any were attacked by the disease. The third case occurred at Umballa—the man had been bitten by a pariah dog in the bazaar about two months previously; the case was very severe, and proved fatal within 24 hours after admission.

*Diseases of the Eye* caused a ratio of admission of 14·4 per 1,000, which is lower than that of the preceding year by 2·4 and than the average rate by 1·4 per 1,000. The prevalence of ophthalmic affections varied considerably in the different districts, from 27·4 per 1,000 in the Peshawar district to 7·2 per 1,000 in the Presidency district. Out of a total of 506 admissions, 382, about three fourths, were due to conjunctivitis or tarsal ophthalmia.

*Diseases of the Ear* caused a ratio of admission equal to 15·1 per 1,000, which is above the average rate by 2·4 per 1,000, though it differs only fractionally from the corresponding rate in the preceding year. Prevalence of aural affections was greatest in the Lahore division, the ratio being 23·6 per 1,000, and least in the Rawal Pindi district, 10·9 per 1,000. Compared with corresponding ratios in the previous year a considerable increase is observed in the Lahore ratio, and a similar decrease in that of Peshawar. The other circles show no great difference. Four fifths of the admissions were due to inflammation or abscess of the external meatus.

*Diseases of the Nose* show a fractional admission ratio, and two thirds of the admissions were cases of epistaxis.

*Diseases of the Circulatory System* were the cause of 465 admissions and 21 deaths, being in the ratios of 13·2 and 60 per 1,000. The ratio of admission has declined by 1·5 as compared with that of the preceding year, and is below the average ratio for the preceding six years by 2·8 per 1,000. The highest ratio of prevalence of these affections in any district was 26·0 per 1,000 in that of Meerut, Sirhind coming next with 20·8 per 1,000; the lowest ratio was in Saugor 4·9, Peshawar being next above with 6·9 per 1,000. Increase of prevalence as compared with the preceding year occurred in the Presidency, Allahabad, Meerut, and Rawal Pindi districts, and decrease in the remainder. The greatest increase was 7·9 per 1,000 in the Rawal Pindi district, and the greatest decrease, 19·0 per 1,000, in that of Peshawar. The ratio of mortality from diseases of the circulatory system is slightly above the average rate, and more than twice that in the preceding year. In that year there was no mortality in six of the administrative circles, but in the year under report all were affected, the ratio varying from 1·35 per 1,000 in the Lahore district to 23 in the Rawal Pindi circle. Mortality increased in all the divisions but Oudh and Peshawar, in each of which there was a small fractional decrease. Among the admissions were 282, or more than half the total, for palpitation, 111 for organic heart disease, and 7 for aneurism. The causes of death were valve disease of the heart, 7 cases; fatty degeneration, 6; hypertrophy, 2; and dilatation of the heart, 1 case; also aneurism, 3 cases, and angina pectoris and pericarditis one case respectively.

*Diseases of the Absorbent System* were the cause of 566 admissions, equal to a ratio of 16·1 per 1,000, which is greater than that in 1884 by 1·3, but below the average ratio by 1·9 per 1,000. The admission ratios in the different districts varied from 30·9 in the Saugor circle to 11·8 per 1,000 in that of

Bengal.

Lahore. A considerable increase in admission for these affections is observed in the Saugor district, equal to 20·8 per 1,000; but with the exception of a decline of 9·9 in the rate for Allahabad, there is no great difference in the ratios of the other circles as compared with the preceding year. 481, or more than five sixths, of the admissions were due to affections of the inguinal glands.

Under the head of diseases of the ductless glands are returned four admissions for goitre.

*Diseases of the Respiratory System* caused 1,372 admissions and 23 deaths, being in the ratios of 39·1 and ·65 per 1,000 respectively. Compared with corresponding ratios in the preceding year a decline is observed in both, one of 6·7 in the former case and of ·15 in the latter. In comparison with similar average rates for the previous six years decrease is also observed, being 14·7 per 1,000 in case of admission and ·73 in that of mortality. Respiratory affections were most prevalent in the Peshawar circle, where the ratio of admission reached 58·0 per 1,000; the ratios in the Lahore and Meerut circles were also high, 50·2 and 49·7 per 1,000 respectively; the least prevalence was in the Presidency circle, 25·6 per 1,000, the Oudh circle being next above with 26·7 per 1,000. Compared with the return for the previous year decrease of admission rate has occurred in all the districts with one exception, Saugor, where an increase of 14·9 is observed. In Peshawar the decrease equals 25·9 per 1,000. Mortality was greatest in the Presidency circle, the ratio being 1·53 per 1,000; in Gwalior and Rawal Pindi mortality was *nil*. The death rates have increased in the Presidency, Oudh, Rohilcund, and Sirhind circles, but have decreased in the remainder as compared with those of the preceding year. Bronchial affections were the cause of five sixths of the admissions, and among those remaining were 138 cases of pneumonia, and 47 of pleurisy. Of the deaths, 20 were caused by pneumonia, 2 by bronchitis, and 1 by acute pneumonic phthisis.

*Diseases of the Digestive System* were the cause of 7,662 admissions and 69 deaths, including 8 of invalids, being in the respective ratios of 218·3 and 1·97 per 1,000. The ratio of admission compares favorably with that in the preceding year, and also with the average rate of the previous six years, a decline of 7·1 per 1,000 being observed in the former case and one of 16·7 in the latter. Mortality, however, was greater than in 1884, the increase in death rate being equal to ·49 per 1,000, still, compared with the average rate, a decline of 1·68 per 1,000 is observed.

Digestive disorders show the highest ratio of prevalence in the Gwalior circle, 309·3 per 1,000, being followed by 259·5, 257·2, and 255·7 in the Allahabad, Sirhind, and Rohilcund circles respectively; the lowest ratio of prevalence was 159·1 per 1,000 in the Presidency district, the next above being 183·1 and 193·3 in the Oudh and Rawal Pindi districts. Compared with the return in the preceding year increase in ratio of prevalence has occurred in the Saugor, Gwalior, Meerut, and Lahore districts, which in the first-named equalled 67·5 per 1,000. Among the districts in which decrease has occurred those in which it is most marked are the Peshawar circle, with 69·1 per 1,000, and the Presidency, with 34·0. Mortality was highest in the Saugor and Oudh divisions, the death rates being 2·80 and 2·77 per 1,000; and lowest in the Gwalior and Presidency circles, the rates being 1·01 and 1·03 per 1,000 respectively. Compared with the preceding year mortality declined in the Allahabad, Sirhind, Rawal Pindi, and Lahore circles, but increased in the remainder, particularly in the Oudh, Rohilcund, and Saugor divisions, where the increment was equal to 1·60, 1·57, and 1·36 per 1,000 respectively. The principal causes of admission were diarrhoea, 1,967 cases; dyspepsia, 1,347; hepatic affections, 939, including 48 cases of abscess of the liver; dysentery, 864; tonsillitis, 672; colic, 357; sore throat, 293; hæmorrhoids, 292, &c. The deaths were as follows:—39 were caused by hepatic disease, including 30 cases of liver abscess, 4 of hepatitis, 3 of cirrhosis, and one each of enlargement of the liver and jaundice. Dysentery caused 15 deaths; intestinal obstruction, 3; ulcer of the stomach, enteritis, diarrhoea, and peritonitis, 2 cases each; and perforation of the stomach, typhilitis, ulceration of intestines, and hypertrophy of the spleen, one case respectively.

In Abstract XIX. is a table taken from the report of the Principal Medical Officer showing the prevalence of dysentery, diarrhoea, and hepatitis in each of the divisions of the command, and the deaths caused thereby; and in

Abstract XX. is a table showing the prevalence of, and mortality from, the same diseases in each quarter of the year. Bengal.

The first-named table shows that the admission rate for dysentery was 24·6 and the death rate 34 per 1,000, as compared with 21·6 and 18 in the preceding year. The highest ratio of prevalence in any district was 37·8 per 1,000 in Gwalior, Allahabad being next with 36·5; the lowest ratio, 14·3, was in the Peshawar circle, the Saugor and Rawal Pindi circles also having low rates, 16·1 and 16·2 per 1,000. Compared with the previous year there was a slight increase of prevalence in every district except that of Peshawar. Mortality was greatest in the Peshawar district, the ratio being 82 per 1,000, and has increased in all the districts except three, Meerut, in which there was a decline of 21, and Allahabad and Gwalior, in which there were no deaths. The ratios of prevalence of, and mortality from, diarrhoea were 56·1 and 03 per 1,000, the former being higher by 5·5 than in the previous year, while there is no change in the latter. The greatest prevalence of diarrhoea was in Gwalior, where the ratio was 119·9 per 1,000, and the least was in the Presidency circle, 29·2 per 1,000. In Gwalior and in the Meerut circle diarrhoea was much more prevalent than in the previous year, and in Rohilcund a good deal less so. In the remaining districts variation is not greatly marked. Hepatitis, including abscess of the liver, caused a lower admission rate than the preceding year, 20·7 compared with 25·5 per 1,000, but the mortality rate, 88 per 1,000 was increased slightly. In the Allahabad circle was the highest rate of prevalence, 28·7 per 1,000, and the lowest rate of mortality, 33 per 1,000. The lowest rate of prevalence was 16·5 per 1,000 in the Lahore circle, and the greatest mortality was 1·94 in Oudh. These affections were less prevalent in all the administrative circles except Saugor, the most marked decline being 11·1 in the Peshawar division. The death rates increased in six circles, to the greatest extent, 1·23 per 1,000, in Rohilcund, and decreased in the remainder, the Allahabad circle showing the greatest decrease, 1·11 per 1,000.

In Abstract No. XX. it is observed that the greatest prevalence of dysentery was in the fourth quarter of the year, followed by the third, the first quarter showing the lowest ratio; diarrhoea, as in the preceding year, was by far most prevalent in the third quarter, being nearly twice as frequent as in the fourth quarter and three times as frequent as in the second, the least prevalence was in the first quarter; hepatitis and abscess of the liver show the greatest prevalence in the third quarter, followed by the second, and the least in the first; and the greatest mortality was in the first quarter of the year.

Among diseases of the urinary system gonorrhoea and its sequelæ caused an admission rate of 170·7 per 1,000, being higher than in the preceding year by 21·2, and also higher than the average rate for the preceding six years by 38·2 per 1,000. The greatest prevalence of these affections was in the Saugor, Presidency, and Peshawar circles, the ratio in the first named being 193·8 per 1,000, and the other two being only just lower; the lowest rates, 137·2 and 137·6 per 1,000, are found in Sirhind and Gwalior. In seven of the districts the ratio of prevalence has increased, most markedly in Peshawar and Saugor, the increase amounting to 69·3 and 67·4 per 1,000 respectively. In the districts where a decline is observed it is in no case of any extent. Other diseases of the urinary system were at the rate of 12·8 per 1,000, being more frequent than in the previous year and also above the average, the increase in ratio being 1·8 and 2·2 per 1,000 respectively. Among the admissions, 12 for Bright's disease are returned, which also caused 5 deaths, including 2 of invalids. Four deaths were due to nephritis, and one death to traumatic stricture of the urethra.

Diseases of the Generative System were the cause of an admission rate of 12·0 per 1,000, which is fractionally below the average rate and fractionally above that of the previous year. Prevalence varied from 21·2 per 1,000 in the Gwalior district to 6·8 in that of Rohilcund. Of 423 admissions for affections of this system more than three fourths were cases of orchitis.

Diseases of the Organs of Locomotion also only differ fractionally in ratio of frequency as compared either with the last year's or the average rate, that for the year under report being 6·0 per 1,000. The total number of admissions was 211, more than half of which were due to synovitis.

Diseases of the Cellular Tissue gave 704 admissions, of which 530 were cases of abscess. Two deaths are returned, one from inflammation and the other from abscess of the cellular tissue. The admission ratio, 20·1 per 1,000, has

*Bengal.*

declined from that in the previous year by 1·7 per 1,000, but is a little above the average rate.

*Diseases of the Cutaneous System* caused a ratio of admission of 82·8 per 1,000, being above the average rate by 3·5, but below the rate in the previous year by 4·3 per 1,000. The prevalence of cutaneous affections in the different districts varied considerably, the highest ratio being 112·8 per 1,000 in the Allahabad circle, and the lowest 64·6 per 1,000 in the Saugor district. The ratios were high in Lahore, Rohilcund, and Gwalior, but low in Rawal Pindi, Sirhind, and Oudh, the rate of the last-named circle having declined considerably from the preceding year. Increase of prevalence is noticed to some extent in the Allahabad and Rohilcund circles, and decrease in Peshawar, but the variations in the remaining districts are not marked. About half the admissions were due to ulcers and boils; eczema, whitlow, warts, ingrown nails, and the different varieties of tinea being also among the most frequent causes of admission.

Under the head of *debility* 442 admissions and one death are returned; the admission ratio was 12·6 per 1,000, which, though higher than in 1884 by 1·7, is lower than the average ratio by 17·1 per 1,000. The highest admission rate recorded in any circle was 23·2 per 1,000 in Gwalior, and the lowest 5·6 in Oudh.

*Poisons.*—325 admissions are recorded, and of these all but one, a case of opium poisoning, were due to the effects of alcohol. The admission ratio was 9·3 per 1,000, being lower than the rate in the previous year by 1·1, but above the average by 3·8 per 1,000. There were 7 deaths, 4 recorded as alcoholic poisoning and 3 as delirium tremens; the mortality rate equalled ·20 per 1,000, below the average by ·11, but almost identical with the rate in the previous year.

*Injuries.*—The admission rate for injuries was 130·6 per 1,000, and the death rate 1·36, as compared with 122·0 and 1·19 per 1,000 respectively in 1884, and with 103·9 and 1·43 per 1,000, average rates. Under the head of general injuries, 12 admissions to hospital and 19 deaths are returned. The admissions were due to multiple injury in 5 cases, burns and scalds in 4, and asphyxia from drowning in 3 cases. The deaths were caused as follows:—One from extensive and severe burns resulting from an explosion of gunpowder at Jubbulpore; four from multiple injury, of which three occurred in a railway accident between Umballa and Rawal Pindi, two other men being seriously injured at the same time; nine deaths from drowning, of which four were suicidal, and the remainder accidental; three deaths from hanging, two of which were suicidal and one judicial, the latter occurred at Umballa, where the man had shot a sergeant of his own regiment; there were also two deaths from lightning stroke, one of which occurred at Lucknow, and the other at Jubbulpore. The admissions for local injuries numbered 4,574, of which contusions, wounds, and sprains furnished 3,974; of the remainder the principal causes were blisters of the feet, 286; fractures, including 5 of fracture of the skull, 178; dislocation, 44; and gunshot wounds, 39. The deaths were 29 in number; 16 were due to gunshot wounds, of these 9 were suicidal, 3 accidental, and 4 homicidal; 6 were caused by fracture, one being from fracture of the spine resulting from a fall from a horse, and 5 being from fracture of the skull, 4 of which were accidental and one was suicidal; three deaths were due to cut throat, all self-inflicted; and the remaining deaths were accidental, comprising two cases of rupture of the spleen, one of injury to the spinal cord, and one of laceration of the brain.

The cases of homicide were as follows: one at Mooltan, where a sergeant of the Border Regiment was shot by a civilian; one at Umballa, a sergeant of the Cheshire Regiment being shot, while asleep on his bed, by a private of the same corps; one at Fort William, a corporal, Royal Artillery, being shot by a man of his own battery whom he was attempting to disarm in the barrack-room; and one at Barrackpore, a drummer, Royal Welsh Fusiliers, being shot by a man of the same regiment.

The cases of suicide were 19 in all, 9 from gunshot, 4 from drowning, 3 from cut throat, 2 from hanging, and one from jumping from a height. In 9 the motive for the act could not be ascertained, but in 9 the men were suffering from the effects of drink; domestic trouble was assigned as the cause in one case. Of the suicides, four occurred in one regiment, two each in two

regiments and a troop of horse artillery, and single cases in nine corps or *Bengal*. batteries.

**Surgical Operations.**—The following are recorded:—An amputation of the forearm on account of injury resulting from the bursting of a gun, amputation of the lower third of the thigh on account of disease of the knee-joint, both of which were successful; also 4 amputations of fingers, 3 on account of injury from gunshot wound, and one on account of disease, all with satisfactory results. Aspiration of hepatic abscess was performed in three instances, with fatal result in two cases; paracentesis abdominis was practised twice on the same patient on account of ascites, the first time affording temporary relief, but the case subsequently proved fatal; and paracentesis thoracis was performed in two cases with satisfactory results. Lithotomy was successfully performed in one instance, and two cases of external urethrotomy were undertaken, one of which was successful, but in the other case a fatal result ensued from septicæmia. The remaining operations comprised two for varicose veins, and one for formation of artificial pinna, removal of hæmorrhoids, removal of warts, and fistula in ano respectively; also several other minor operations, all with satisfactory results.

**Invaliding.**—The number of men sent home as invalids during the year was 714, being in the ratio of 20·34 per 1,000 of the strength, which is lower than the corresponding ratio in the previous year by 11·48, and than the average similar ratio for the preceding decennial period by 15·89 per 1,000. The ratios of invaliding in the different arms of the service (see Abstract XLIII.) were 27·54 per 1,000 in the cavalry, 30·61 in the artillery, and 16·38 per 1,000 in the infantry. Compared with the corresponding rates in the preceding year an increase of 4·45 per 1,000 is observed in the invaliding rate in the cavalry, but a decline of 6·31 in the artillery, and one of 14·51 per 1,000 in the infantry. Among particular corps, invaliding in the cavalry was highest in the 8th Hussars, 43·58 per 1,000, at Meerut, and lowest in the 17th Lancers, 19·18 per 1,000, at Lucknow. In the artillery the highest invaliding rate was 93·75 per 1,000, in the 9th Battery, 1st Brigade, Eastern Division, at Delhi; the average strength, however, was only 96; and in several batteries there was no invaliding. Among infantry regiments the highest ratio was 56·06 per 1,000 in the 1st Suffolk Regiment, one wing of which was quartered at Roorkee and the other at Delhi; the lowest ratios, 2·30 per 1,000, occurred in the 2nd Devonshire and 2nd Leicester Regiments at Jhansi and Jubbulpore respectively.

The principal causes of invaliding were as follows:—Fever 51 cases, equal to 1·45 per 1,000; rheumatic affections 15 cases, or 43 per 1,000; secondary syphilis 26, or 74 per 1,000; tubercular diseases 73 (all but one being cases of phthisis pulmonalis), or 2·08 per 1,000; nervous affections 81, or 2·31 per 1,000 (including 34 cases of mental diseases, being at the rate of 96 per 1,000); diseases of the circulatory system 112 cases, or 3·19 per 1,000 (of these 56 were cases of organic heart disease and 36 of palpitation, equal to 1·59 and 1·00 per 1,000 respectively); diseases of the digestive system 118, or 3·36 per 1,000 (among which were 17 cases of dysentery and 63 of hepatic affections, being in the ratios of 48 and 1·79 respectively); and debility 78 cases, or 2·22 per 1,000. Compared with the return for the preceding year decrease is observed in all the above ratios, and is most marked in rheumatic affections, heart disease, and in hepatic disorders; and compared with the similar average ratios for the preceding six years, decrease is also observed particularly in invaliding for affections of the digestive system and debility.

The number of men finally discharged as medically unfit for further service was 483, which gives a ratio of 13·76 per 1,000 of the strength, lower than the corresponding rate in the previous year by 1·84 per 1,000 and than the decennial average rate by 3·06 per 1,000. The principal disabilities causing final discharge were rheumatism, 22 cases, equal to 62 per 1,000; tubercular diseases, 66 cases (64 being phthisis pulmonalis), or 1·88 per 1,000; nervous affections 72 cases, or 2·05 per 1,000 (41, or 1·17 per 1,000, being cases of mental disease); diseases of the circulatory system 105 cases or 2·99 per 1,000 (69 of the cases were organic disease of the heart and 23 palpitation, equal to 1·97 and 65 per 1,000 respectively); diseases of the digestive system 33 cases, or 94 per 1,000, 13 of the cases being hepatic diseases; diseases of the organs of locomotion 26, or 74 per

*Bengal.*

1,000; debility 54, or 1·54 per 1,000; and injuries 14, or ·40 per 1,000. Compared with the corresponding ratios for the preceding year, it is observed that there is very little difference as regards discharge by invaliding on account of rheumatism, digestive diseases, and tubercular affections, that diseases of the nervous and circulatory systems and injuries show a decline, but diseases of the organs of locomotion and debility show increased invaliding. Compared with average ratios for the preceding six years, decrease of invaliding is noticed especially in diseases of the digestive system and debility, but increase has occurred in nervous affections.

Abstract No. XXI. gives a table taken from the report of the Principal Medical Officer, showing the comparative mortality and invaliding in the different grades of commissioned officers, non-commissioned officers, and men, during the year 1885 and for the 10 previous years. It will be observed that the ratios of mortality in all three grades, officers 11·27, non-commissioned officers 18·47, and men 14·35 per 1,000, compare very favorably with those of the decennial average, the decrease in the ratio for officers being 7·72 per 1,000, that for non-commissioned officers 3·75, and that for privates 4·38 per 1,000. However, if these ratios be compared with those of the preceding year, though a decline of 14·72 per 1,000 is observed in the ratio for officers, there is an increase of 5·42 and 2·96 per 1,000 in the ratios of mortality for non-commissioned officers and privates respectively. With regard to invaliding in the three grades, the ratios, 50·30, 18·23, and 19·72 per 1,000 respectively, show, in comparison with decennial average rates, a decrease of ·19 in the case of officers, 20·69 in the case of non-commissioned officers, and 17·97 per 1,000 in that of privates. Compared with corresponding ratios in the preceding year an increase of 1·02 per 1,000 has occurred in the invaliding among officers, but a decline of 14·13 per 1,000 among non-commissioned officers, and one of 9·1 per 1,000 among private soldiers.

In Abstract No. XLVI. will be found a return furnished by the Principal Medical Officer to the Government of India showing the comparative sickness, mortality, and invaliding of men, who extended their service in India and those who had not, in the Presidency for the year ending 31st December, 1885.

From this it will be seen that the proportion of sickness, mortality, and invaliding among those who were completing their extended Indian service, is far less than that of the men of shorter service who were serving under the ordinary conditions.

*Officers.*—The average strength of the officers in the command during the year was 1,203, the attacks of illness 903, the deaths 19, and there were 43 officers invalided home. The ratio of prevalence of sickness, therefore, equalled 750·6, that of mortality 15·79, and that of invaliding 35·74 per 1,000. Compared with the corresponding ratios in the preceding year, there is an increase of prevalence of sickness equal to 39·1 per 1,000, but a decrease in mortality and invaliding equal to 8·60 and 2·11 per 1,000 respectively. Eruptive fevers caused 16 attacks of illness, of which one was a case of small-pox, three were cases of measles, one chicken-pox, and 11 dengue. 25 cases and 4 deaths occurred from enteric fever, being at the rates of 20·7 and 3·32 per 1,000 respectively as compared with 13·8 and 4·05 per 1,000 for non-commissioned officers and men. Compared with corresponding rates in the previous year the rate of prevalence has increased by 3·9, and that of mortality by ·80 per 1,000. The mortality to attack was at the rate of 16 per cent. Other continued fevers caused 106 attacks of illness, paroxysmal fevers, 208, and there was one fatal case of cholera. Among constitutional affections the various forms of rheumatism caused most sickness, 23 cases out of 37. Among local diseases, affections of the digestive system were the cause of most of the illness, the most frequent diseases being dysentery, 31 cases, diarrhoea, 54, and hepatic affections, 34 cases. The deaths of officers in addition to those from enteric fever and cholera, already mentioned, were 2 from apoplexy, 3 from cardiac affections, and one from phthisis pulmonalis, bronchitis, pneumonia, diarrhoea, hepatitis, peritonitis, enteritis, concussion of the brain resulting from a fall from a horse, respectively, also one case of suicide the mode of which is not stated. The causes of invaliding were fevers 7 cases, nervous diseases 7 (including one of melancholia), diseases of the digestive system 16 cases (of which 11 were

hepatic affections) debility 5, effects of injuries 5, and phthisis pulmonalis, *Bengal*. cancer, and asthma one case respectively.

*Women.*—The average strength of women was 1,881, and 1,946 admissions into hospital are returned. Of the latter 504 were cases of ordinary child-birth, so that the admissions for sickness numbered only 1,442; the ratio of admission was 766·6 per 1,000, which has declined by 173·6 from the corresponding rate in the previous year. The mortality rate, 13·29 per 1,000, dependent on 25 deaths, has also declined considerably in this comparison, the decrease being 7·35 per 1,000. Eruptive fevers caused 19 admissions, 15 being for dengue, three for measles, and one for chicken-pox. Enteric fever attacked 10 women, and three cases proved fatal; there were also 76 admissions for other continued fevers and one death is recorded. Ague caused 348 admissions, and remittent fever 26 with 2 deaths; the ratio of prevalence of paroxysmal fevers was 198·7 per 1,000, considerably less than half that among non-commissioned officers and men. Two cases of cholera occurred, both of which proved fatal. One case of puerperal fever is recorded, the patient recovered. The remaining admissions for febrile diseases were one each for whooping cough, mumps, and erysipelas, the last named with fatal result. Among the admissions for constitutional diseases were 26 for various forms of rheumatism, 38 for anæmia, 9 for phthisis pulmonalis, 1 case fatal, and 2 for cancer of the stomach, with 1 death. Nervous affections caused 36 admissions, half being for neuralgia; there were 2 deaths, 1 from sunstroke, and the other from apoplexy. Diseases of the digestive system were the cause of a good deal of sickness, the most frequent being diarrhoea 72 cases, dyspepsia 76; hepatic affections 31, and dysentery 32 cases; 2 deaths occurred from diarrhoea, and 3 from disease of the liver. The admissions for affections of the generative system were 96 in number, more than half being cases of abortion or premature labour; there were 2 deaths in child-birth, and one from metritis, metroperitonitis, and puerperal convulsions respectively. In none of the remaining orders of local diseases was the number of admissions large, and there was no mortality. The admissions for debility amounted to 199.

*Children.*—The average strength of children was 3,563, the admissions into hospital 2,193, and the deaths 189; the ratio of admission, therefore, was 615·5 per 1,000, and that of mortality 53·04 per 1,000. Compared with the corresponding rates for the previous year considerable improvement in health is shown by the admission rate having declined by 132·9, and the mortality rate by 14·10 per 1,000. Eruptive fevers caused 172 admissions, which comprised 1 case of small-pox, 14 chicken-pox, 144 measles, with 5 deaths, 3 scarlet fever, and 10 dengue. There were 6 children attacked with enteric fever, of whom 3 died; other continued fevers caused 148 admissions and 1 death. Ague shows 342 cases and 1 death, and remittent fever 14 cases and 2 deaths. Four cases of cholera occurred, 2 of them fatal. There were 2 fatal cases of diphtheria, and 4 deaths from whooping cough out of 37 admissions. Among constitutional diseases there were a few cases of rheumatism, but the majority of the admissions were caused by tubercular affections, scrofula causing 10 admissions and 1 death, and tabes mesenterica 18 admissions and 11 deaths; 1 death from anæmia was also recorded. Among local diseases affections of the nervous system caused 74 admissions, 59 being due to convulsions, from which there were 42 deaths; 2 fatal cases are returned from meningitis, hydrocephalus and tetanus respectively, also 1 death from atrophy. Ophthalmic affections show 214 admissions, the great majority being cases of simple conjunctivitis. Respiratory diseases caused 232 admissions, of which 205 were bronchial affections, with 17 deaths; pneumonia caused 10 admissions and 3 deaths; and croup 13 with 4 deaths; there were also 4 cases of laryngitis. The admissions for disorders of the digestive system were very numerous, the most frequent being diarrhoea, 286 cases, and 39 deaths; teething 107 and 15 deaths; and dysentery 47 and 2 deaths. Two deaths are returned from diseases of the spleen, and one from thrush and jaundice respectively. The admissions under other orders of local diseases were not numerous, except cutaneous affections, but none call for special mention. Ten admissions and 9 deaths are recorded for premature birth and 96 admissions and 9 deaths for debility. There were also 5 deaths



*Bengal.*

the result of injuries, 2 from fracture of the skull, and 1 from burn, concussion of the brain, and overlying respectively.

**SANITARY CONDITIONS.**—The following are the principal remarks on the health and sanitary condition of the different divisions and stations throughout the year, taken from the report of the Principal Medical Officer.

*Presidency District.*—The general health conditions at the several stations are reported to have been good, and no important additions or alterations were found necessary. The heavy rainfall in July and August in and around Calcutta led to an increase of malarial fever. Dengue was very prevalent, and there were a few cases of cholera. There was a general complaint of the want of an issue of vegetables to the troops, and several cases of scurvy occurring in the plains were sent to Darjeeling. The water supply was good at all the stations except Dum Dum, which depends on a tank surrounded by habitations, and the water has been found, on analysis, to be impure. It is stated that an effort will be made to connect the station with the Calcutta water-works, the mains of which pass within a distance of three miles. The surface drainage is imperfect, owing to the fact that the station lies low; and it is consequently subject to floods. At Barrackpore and Calcutta the sanitary conditions were good and accommodation sufficient; at Darjeeling, also, sanitation is said to have been satisfactory, and the water supply excellent; but it is stated that the hospital accommodation was insufficient for the demands made on it, and an adjacent barrack-room had to be utilised also for this purpose.

*Allahabad Division.*—The general condition of the several stations is reported to have been good, and no disease could be traced to defective arrangements in barracks or their vicinity. In Allahabad, both in the fort and cantonment, the sanitary arrangements were excellent. Owing to the danger of cholera in the autumn months the troops were moved into camp on high ground, a few miles off, with good effect. At Cawnpore and Dinapore the sanitary conditions were good, and it was unnecessary to make any recommendations. At Benares the general sanitation of the station was satisfactory; but increased bath-room accommodation is required for the station hospital. Chunar is said to be still notoriously unhealthy, but the sickness is not due, apparently, to any sanitary defect.

*Oudh Division.*—It is reported that the sanitary condition of the several stations was satisfactory. At Lucknow a few cases of cholera occurred, also an epidemic of dengue, which continued during the last three months of the year, causing some temporary inefficiency. The military prison, which is situated close to the native city, has been abandoned, the prisoners having been transferred to the building in cantonments formerly used as a cavalry hospital. The station hospital was completely re-roofed during the year. Fyzabad is said to be, owing to its position, generally unhealthy; it is liable to inundations from the River Gogra, the ground is very level, and surface drainage is difficult to accomplish. The Principal Medical Officer of the division states his opinion that the existence of what are termed absorption wells, for the disposal of water from lavatories and bath-rooms, is a sanitary defect needing attention. Some cases of enteric fever occurred among the officers; the bungalows are described as being dilapidated and insanitary. The station hospital has been re-roofed, and a new chimney provided to the cook-house. At Sitapur there was, it is stated, much malarial sickness among the troops; but the sanitary condition of the station was good, and called for no suggestion of improvement.

*Rohilcund Division.*—It is stated that the sanitary condition of the different stations in the Command was satisfactory, but there was a marked prevalence of malarial sickness, due, it is supposed, to an unusually heavy rainfall. At Naini Tal the sanitation of the station is reported to be satisfactory generally, but the building formerly occupied by families, but now by single men, is badly constructed and deficient in ventilation. At Ranikhet no sanitary defect was noticeable inside the barracks or hospital, but excessive diarrhoea prevailed during the rainy season, which was attributed by the medical officer in charge to the large amount of decaying vegetable matter, and the number of trees around the barracks; steps had been taken to remedy this defect. At Chaubattia, while the sanitary arrangements were generally satisfactory, the accommodation for the soldiers' families was insufficient. Some

cases of scurvy also occurred, owing to deficiency in the vegetable ration. At *Bengal*. Moradabad the surface drainage is said to be defective, owing to the level nature of the ground; steps have been taken to remedy this condition. At Bareilly there was some difficulty about the disposal of the waste water from bath rooms, owing to the conduits not being carried far enough away from the buildings, but suggestions for remedy have been made. The station hospital is said not to be well suited for its present purpose; it was built for a cutcherry. From Shahjehanpore the sanitary report is in all respects satisfactory.

*Saugor District*.—At Jubbulpore, the sanitary arrangements are reported to be good, and the only defects noticed were the insufficient ventilation of the garrison cells and some fault in the surface drainage in parts. At Saugor the general sanitary condition is stated to be very good. The barracks and hospital are old, and do not, it is thought, meet the requirements of the present day. The report from Nowgong is generally satisfactory. At Pachmarhi the barracks are said to be very hot, owing in some measure to the low roofs of corrugated iron. Some attempt has been made to remedy this by the use of felt beneath the metal, but without much success. The Principal Medical Officer remarks that, owing to the effects of climate, great heat during the hot season, and excessive rainfall during the monsoon, Pachmarhi is not considered a suitable place as a sanatorium for British troops. It has been said that the place would, however, be admirably suited as an acclimatising station for a regiment recently arrived from England.

*Gwalior District*.—The general sanitary condition of the cantonment of Morar was satisfactory; but the station being extremely flat, surface drainage is always a difficulty. The hospital was not sufficiently large to accommodate all the patients during the autumn months when fever was prevalent. Tents were therefore made use of to make up for the deficiency. The sanitary condition of Fortress Gwalior was in every way satisfactory; and regarding Jhansi, it is said that the position of the station as regards facilities for drainage renders it a healthy one for European troops, and that the sanitary arrangements generally are satisfactory.

*Meerut Division*.—The general health of the troops was not so good as in the previous year, which is due in a great degree to the unusual prevalence of malarial fever at nearly all the stations. Sporadic cases of cholera occurred, and a slight outbreak of scurvy appeared, but there was no prevalence of epidemic disease anywhere. The general sanitary condition of the station of Meerut was satisfactory. The cantonment grass lands, instead of being grazed by cattle as heretofore, were allowed to have grass grown on them. This, owing to the great increase of damp, is thought by some to have been the cause of the malarial sickness, but the Principal Medical Officer is of opinion that the disease was due rather to a general than a local cause, as it prevailed universally in this and other divisions. The hospital accommodation was insufficient, owing to the great amount of sickness in the autumn. Measures are being taken to remedy this. In Delhi, though the sanitary arrangements in the station were generally satisfactory, there was a marked prevalence of malarial fever, and from the situation of the barracks it is said the miasm from the river is carried right into the men's rooms, ventilation of which is imperfect owing to high surrounding walls. At Muttra no sanitary defect was reported, except that the accommodation for patients in the hospital for soldiers' families is said to be bad and insufficient, a matter which was about being inquired into. Regarding Agra and Fatehgarh, it is stated that the sanitary condition both of barracks and hospitals, was satisfactory, and the general health of the troops was good. The sanitary state of Roorkee was generally good, but the barrack cook-houses are old and dilapidated, and new buildings are required. At Landour and Chakrata sanitation was satisfactory.

*Sirhind Division*.—At Umballa extensive repairs were carried out in several of the barrack bungalows, and latrines of a new and improved pattern were placed in the compounds of all the bungalows in the station. The general sanitary condition of the cantonment was satisfactory, and the health of the troops good, but there was an outbreak of dengue amongst them during the autumn months. At Jullundur the sanitary state of all the barrack buildings was satisfactory, and no recommendations were required. Favorable reports as to general health and to sanitary conditions were

*Bengal.*

received from the hill stations of Kasauli, Subathu, Dagshai, and Jutogh; and with regard to Solon, it is remarked that the sanitation of the huts used for barracks and hospitals was good. An additional ward for six men has been sanctioned for the hospital at Solon, concrete floors for the men's huts, and wooden floors for the officers' quarters; also verandahs for one side of the barrack huts.

*Lahore Division.*—At Fort Lahore the barracks are old and surrounded by high walls, which render ventilation difficult. The wards are also badly ventilated and are ill-suited for their purpose. A drain running from a Hindoo temple in the vicinity, which has been a nuisance, was removed during the year. At Mean Meer no sanitary defects were reported, and at Ferozepore the general sanitary condition was said to be satisfactory, but some of the latrines were badly constructed and out of repair; however, means were taken to remedy this defect. At Mooltan the surface drainage is very defective, owing to the configuration of the ground. It is remarked that cholera, which had been unknown for so many years, appeared in the station in the month of June; it is believed that the disease was imported from Rindli by coolies who passed through the station by railway. The general sanitary condition of Amritsar was satisfactory, and there were no defects in the barracks likely to have an unfavorable effect on health. The hill stations of Dalhousie and Bhagsu are also favorably reported upon.

*Rawal Pindi Division.*—At Rawal Pindi a new section of the station hospital was opened. The building, which was formerly one of the barrack bungalows, is well adapted for the purpose; but it is rather disadvantageously placed, owing to its proximity to the barracks. One defect is noticed, that the main surface drain of the barracks runs through the compound of the new hospital. It is remarked, also, that the means of warming the barrack buildings during the cold weather does not seem to be perfect. At Fort Attock no insanitary conditions have been noted. The barracks and hospital are on high ground and well above the neighbouring town. At Sialkot some improvements have been made in the general surface drainage of the barracks and their surroundings, and the sanitary arrangements of the station generally are said to have been excellent. The general sanitary condition of Murree and the neighbouring stations, comprising the hut barracks and encampments at Bara, Khyra and Changla-Gullies, Kuldunna, Kalabagh, Gharial, and Topa, was satisfactory, and though the troops suffered some inconvenience from being under canvas during the rains, the change from the plains in the hot weather was in every way beneficial to health.

*Peshawar District.*—The sanitary condition of Peshawar is reported to be satisfactory. The barracks and hospitals have been much improved of late, and the restrictions which have been placed on cultivation and irrigation within the limits of the cantonment have had a good effect, and have considerably lessened the prevalence of malarial fever. At Nowshera the sanitary condition is generally satisfactory, but here also, owing to the level nature of the ground and the want of proper channels, the surface drainage is defective. With regard to Cherat it is stated that this hill station can scarcely be looked upon as a satisfactory sanatorium for troops stationed in the Peshawar Valley. The men live in tents, and the heat for several months is excessive. The sanitation during the year was defective. The latrines were badly constructed, and there was difficulty in obtaining dry earth, as well as in disposing of the excreta. The bazar was overcrowded, and the water although pure when drawn frequently became contaminated in transit from the wells to the camp. However, recommendations on the above points have been submitted, which, if carried out, cannot fail to have a beneficial effect on the health of those occupying the station during the hot season.

## II.—MADRAS.

*Madras.*

The average strength of warrant officers, non-commissioned officers, and men serving in the command during the year was 10,414, the number of admissions into hospital 12,105, and the deaths 102, inclusive of those of invalids who died on passage home or after arrival in England; the average number of men constantly sick was 686·02. The ratio of admission per 1,000 of strength was, therefore, 1162·4, that of death 9·79, and that of constantly sick 65·87. Compared with the corresponding ratios for the preceding year, an increase is observed in all those of the year under report, being 56·2 per 1,000 in ratio of admission, '54 in that of mortality, and 6·73 per 1,000 in that of constant inefficiency through sickness; but in comparison with the average similar ratios for the preceding 10 years there is a decrease of 10·3 per 1,000 in the admission rate, and one of 4·83 in the mortality rate, but an increase, 7·37 per 1,000, in the constantly sick rate. The average sick time to each soldier was 24·04 days, and the average duration of each case of sickness 20·68 days, the former being longer than the corresponding period in the previous year by '82 days, and the latter shorter by '31 days; but compared with the average of similar periods in the preceding 10 years the average sick time to each man has increased by 2·69 days, and the average duration of each case of sickness by 2·47 days.

The total loss of service by death and final discharge as physically unfit for further service was 247 men, or 23·72 per 1,000 of strength, as compared with 23·68 in the previous year.

In Abstract XXIII. is a table taken from the report of the Principal Medical Officer, Surgeon-General J. Irvine, C.B., showing the average strength, admissions, deaths, &c. at the different circles and stations in the command. The highest ratio of admission in any circle occurred in Burmah, and was 1228·0 per 1,000; the Bangalore and Eastern circles following closely after with ratios of 1214·9 and 1141·8 per 1,000 respectively; the lowest admission ratio was 994·7 per 1,000 in the Western circle, but in this there was an increase of 114·7 as compared with the preceding year. The ratios for the Nagpore and Bangalore circles are increased in this comparison by 209·2 and 220·9 per 1,000 respectively. Mortality was highest in Burmah, 12·66 per 1,000, the Western district following with 11·59, while the lowest ratio, 2·91 per 1,000, occurred in the Nagpore circle. The average number constantly sick was greatest in the Eastern district, 86·35 per 1,000, and was least, 54·26, in the Nagpore circle. With the exception of the last-named district, an increase is observed in this ratio in all the circles as compared with the preceding year. Taking individual stations, and excluding hill depôts and those stations whose average strength was under 100, as well as Belgaum, which was transferred from the Bombay command to that of Madras on the 12th November, it is found that the highest admission rate was 1461·4 per 1,000 at Toungoo, followed by 1441·2 at Bellary, and 1434·8 at Thayetmyo; these rates have all increased, as compared with those in preceding year, by 195·0, 476·9, and 512·0 per 1,000 respectively, while in comparison with average decennial ratios those of Toungoo and Thayetmyo have increased by 369·8 and 398·4 per 1,000 respectively, and the ratio for Bellary has declined slightly. The lowest admission rate was 798·6 at Port Blair; it was a good deal below the average rate, though higher than that in the preceding year by 110·7 per 1,000. The ratio for Malliapooram, 857·1 per 1,000, is also low, having declined by 321·8 from the rate in the preceding year. The ratios of mortality range from 17·09 per 1,000 at Calicut, to 2·04 at Kamptee. Thayetmyo, Toungoo, and St. Thomas' Mount also show high rates, 14·99, 14·96, and 14·18 per 1,000 respectively, and Bangalore, Madras, and Bellary low ones, 3·44, 4·57, and 5·20 per 1,000. Mortality ratios have increased in seven stations, and decreased in the remainder. The highest rate of constant inefficiency on account of sickness was 92·20 per 1,000 at St. Thomas' Mount, Madras and Bellary also having high rates, 83·84 and 84·29 per 1,000 respectively; the lowest rates were 35·97 at Port Blair and 50·42 at Malliapooram. With regard to the hill depôts, the ratio of admission at Poonamallee equalled 1915·2 per 1,000, which is rather lower than the rate in the preceding year and than the decennial average rate, while that at Wellington, 1402·2 per 1,000, is increased in both

Madras.

these comparisons. The mortality ratio at Poonamallee, 50·85 per 1,000, is rather above the corresponding average rate, and that at Wellington, 13·59 per 1,000, fractionally below it.

In Abstract XLIV. will be found the more important of the health statistics of the corps which served in the command during the year. Taking the different arms of the service, it is observed that in the cavalry the admission rate was 1139·6 per 1,000, and the mortality rate 6·76, being lower than those in the preceding year by 64·8 and 2·03 respectively; the average constantly sick equalled a ratio of 58·56, which shows a slight decline. In the artillery the admission rate was 1181·2, the death rate 9·11, and the constantly sick rate 65·13 per 1,000, which are higher than in the preceding year by 62·1, 1·46, and 6·31 per 1,000 respectively. In the infantry the admission rate, 1155·4 per 1,000, was greater by 68·0, but the mortality rate, 8·46 per 1,000, was higher by ·33, and the constantly sick rate, 63·24 per 1,000, was increased by 7·79. Comparing the three arms, it is observed that the artillery caused the highest admission and constantly sick rates, and the infantry the highest mortality rate. The cavalry comprised only two regiments, the 12th Lancers at Bangalore and the 14th Hussars at Secunderabad; the admission ratio of the former regiment reached 1387·5 per 1,000 and that of the latter 905·9, but the mortality ratio was highest in the latter regiment, 10·94, the rate in the former being only 2·32 per 1,000. In the artillery, taking batteries whose annual average strength was over 100, the highest admission and constantly sick rates, 1562·5 and 97·22 per 1,000 respectively, were in T Battery, 3rd Brigade, quartered at Secunderabad, and the lowest, 717·1 and 32·90 per 1,000, in M Battery, 2nd Brigade, at Bangalore; the mortality ranged from 29·70 per 1,000 in the 8th Battery, 1st Brigade, London Division, to *nil* in several batteries. In the infantry the highest admission ratio was 1513·9 per 1,000 in a wing of the 2nd Battalion Royal Scots Fusiliers at Toungoo, followed by the 2nd Bedfordshire Regiment at Bellary with 1387·7; the lowest rate was 737·9 per 1,000 in the 1st Rifle Brigade at Belgaum, but that station was not two months in the command; the next above was the 1st Oxfordshire Light Infantry, stationed at Bangalore and Quetta, with 918·5; the highest mortality rate was 16·36 per 1,000 in a wing of the 2nd Royal Scots Fusiliers at Thayetmyo, the 2nd Hampshire Regiment with 15·41 at Secunderabad being next; the lowest rate was 4·21 per 1,000 in the 2nd South Wales Borderers at Madras; the average ratios of constant inefficiency through sickness vary from 79·86 per 1,000 in the 2nd Bedfordshire Regiment at Bellary, to 38·83 in the 1st Rifle Brigade at Belgaum.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract XXII., and the relative prevalence of sickness and mortality from them in each of the administrative circles is given in Abstract XXIV., taken from the report of the Principal Medical Officer.

**GENERAL DISEASES.**—The admission ratio for this class of diseases was 341·4 per 1,000, and that of mortality 4·22, the former below the corresponding ratio in the preceding year by 4·8, and the latter higher by ·70 per 1,000, while both are lower than average similar ratios for the preceding six years, the former by 98·6 and the latter by ·08 per 1,000.

**Diseases of the Febrile Group.**—The ratio of admission for febrile diseases was 158·3 per 1,000, and that of mortality 2·59 per 1,000, which compare favorably with 180·6 and 2·87 in the preceding year, and with average ratios for six years of 271·8 and 3·24 per 1,000 respectively. The ratio of constant inefficiency on account of fevers was 6·00 per 1,000, a decline of 1·11 from the previous year's rate, and of 2·24 from the average rate. Among the different administrative circles it is observed that Nagpore shows the greatest prevalence of fevers but the lowest mortality, the ratios being 376·0 and ·97 per 1,000 respectively; in the three preceding years also this district has shown the greatest prevalence of febrile affections; in the year under report, however, the admission rate has declined by 207·0 as compared with the previous year. The Western district, as was also the case in 1884, gave the lowest admission rate for fevers, 77·5 per 1,000, which is slightly higher than in the previous year; in this comparison the prevalence of fevers in the Hyderabad Force is also slightly increased, but in the remaining divisions the admission rates have declined. The highest mortality ratio was 4·86 per 1,000 in the Hyderabad Force, followed by 3·57 in the Western district. Mortality decreased in the

Nagpore and Eastern districts by 3·88 and 3·54 per 1,000, and slightly in the Bangalore division, but increased somewhat in the remaining districts. *Madras.*

*Eruptive Fevers* caused 11 admissions, among which were 6 cases of small-pox. This disease was far less prevalent than in the previous year, when 19 cases occurred. Three of the cases occurred at Kamptee, one at Cannanore, and one at Bellary; in these three places it is stated that the disease was very prevalent in the bazaars, and the cases were probably contracted there; a modified case also occurred at Bangalore. All the cases recovered. It is stated also that in all the cases the men bore satisfactory marks of vaccination. The remaining admissions for eruptive fevers comprised 3 cases of measles and 2 of chicken-pox.

*Enteric Fever* was the cause of 73 admissions and 23 deaths, as compared with 129 admissions and 18 deaths in the previous year. The ratios of admission and mortality, 7·0 and 2·21 per 1,000, are above the average ratios for the preceding six years by 2·0 and 70 per 1,000 respectively, but compared with those in the preceding year the admission ratio has declined by 4·9, and the mortality ratio has increased by 55 per 1,000. The ratio of mortality to attack, which had fallen in the previous year to 13·9 per cent. from 30·8 per cent. in 1883, rose again in the year under report to 31·5 per cent.

In Abstract XXV. is a table, taken from the report of the Principal Medical Officer, showing the stations at which the admissions and deaths from enteric fever took place in each of the four quarters of the year. It will be observed from this table that the largest number of cases of enteric fever occurred at Secunderabad, 29 cases with 10 deaths, as compared with 39 cases and 10 deaths in 1884; at Bangalore the number of attacks fell from 60 in the previous year to 18, of which one was fatal; at Bellary the attacks rose from 3 to 8, two of which were fatal; and at Kamptee the number of attacks declined from 15 to 3; at Wellington there were also 3 cases and 2 deaths; and at Port Blair there were 4 cases which recovered; the remaining admissions were single attacks, among which were 5 deaths, at eight stations; there was also one death at Belgaum. Of the total number of attacks 25, with 8 deaths, occurred in the first quarter of the year; 21 and 6 deaths in the third; 14 and 6 deaths in the fourth; and 13 and 3 deaths in the second quarter; in the preceding year the greatest prevalence of the disease was in the third quarter of the year, and the least in the first. With regard to the cases of enteric fever at Secunderabad it is observed that they were spread over the three station hospitals, 5 being in the north, 5 in the central, and 19 in the south station hospital. Concerning those cases treated in the north station hospital it is stated that two of them were, without doubt, contracted outside the cavalry lines, and the other three in all probability in some of the villages and bazaars in the vicinity. The men attacked were all young soldiers, three of whom had been only one year in the country and two had been two years. The cause of the cases treated in the central hospital could not, it is stated, be traced; the sanitary condition of the barracks and their vicinity was good, the food good, and the conservancy well regulated. It is thought probable that the disease might have been contracted in some of the villages situated close outside cantonments, which are generally in a filthy condition. It was also impossible to trace the causes of the cases treated in the south station hospital, the barracks from which they came being in good sanitary state and the water supply pure. It is remarked that in 1884 the majority of cases occurred in the 1st Infantry barracks, but in the year under report most of the admissions came from the 2nd Infantry barracks. Concerning the 18 cases which occurred at Bangalore, and their probable origin, the medical officer in charge alludes to the importance of age, and recent arrival in the country, as predisposing factors, and also remarks that the cases of greatest severity occurred in young soldiers under 25 years of age, lately from home; when the disease occurred in men over that age and with longer Indian service the attacks were mild. Locality exercised but little influence as regards the incidence of the disease, as the cases occurred indiscriminately in different blocks and barracks, and were not confined to any particular branch of the service. He states, further, that to the proximity of the Ulsoor tank and the emanations rising therefrom the prevalence of this fever has been attributed, but points out that certain barracks which were affected are quite a mile and a half from the tank. The

*Madras.*

drying up of this tank is also spoken of as a probable cause of disease, but the medical officer states that the statistics of the last decade fail to show that the condition of the tank water-level exercises the slightest influence. The theory that this Ulsoor water is the sole cause of the disease cannot be held when it is observed that women and children who drink it are comparatively free from attacks of fever, and, on the other hand, the disease is of frequent occurrence among private families who live in isolated houses, with exceptional sanitation, and a water supply obtained from carefully protected wells. With regard to the 8 cases at Bellary, of which two were fatal, it is stated that their origin was exceedingly doubtful. There was no insanitary condition likely to produce disease, and the drinking water was free from any impurity; a possible source of danger is said to have been the milk, which might be under more careful supervision. At the same time it must be remarked that milk is used very sparingly by the men, and children who use the same milk freely do not suffer. The cases at Port Blair occurred in a detachment of a regiment not long in the place, and all the cases occurred in soldiers under 23 years of age who had recently arrived from England. No cause could be assigned for this outbreak. Of the three cases at Wellington the first was admitted a month after arrival from Secunderabad, and it is said that this long interval is an argument against the disease being contracted in that place; however, the disease was then prevalent there. The two men subsequently attacked were in hospital during the treatment of the first man, but nothing positive as to the cause or origin of the disease could be stated. As regards the three admissions at Kamptee it is said that no sanitary defects were detected in barracks except that the dry earth system is often not properly carried out. The single case at Cannanore was attributed by the medical officer to bad water drunk on the march, and a similar origin is reported for the case at Toungoo; while that at Calicut was also thought to be due to the use of water, which on analysis was found to contain a marked increase of organic matter. In the case at Mallapooram the disease was doubtless contracted elsewhere, as the man was admitted two days after arrival. No cause could be assigned for the remaining cases at the different stations.

*Other continued Fevers* caused 784 admissions, being in the ratio of 75·3 per 1,000, which has declined from that in the preceding year by 8·9 per 1,000, and is below the average rate of the previous six years by 3·5 per 1,000. Of the admissions, 270 are returned as simple continued fever. Among the different circles it is observed that these fevers were most prevalent in Burmah, 104·7 per 1,000, and least so in the Nagpore circle, 20·3 per 1,000. In the preceding year also, Burmah had the highest prevalence, and Nagpore the least. Compared with the return for the previous year continued fevers have decreased in prevalence in the Eastern and Nagpore circles and in Burmah, but an increase has taken place in the remaining divisions.

*Paroxysmal Fevers* were the cause of 763 admissions and 2 deaths; the ratio of admission, 73·2 per 1,000, has declined from 80·1 in the previous year, and compares very favorably with the average ratio for the preceding six years, which amounts to 183·1 per 1,000. 713 of the cases are returned as ague and the remaining 50 as remittent fever, and from the latter disease two deaths occurred. The Nagpore circle shows the greatest prevalence of paroxysmal fevers, which was also the case in the previous year, but the admission ratio, which in that year was 517·6 per 1,000, has declined in the year under report to 346·9. The next ratio of admission is 104·2 per 1,000 in Burmah, and this shows an increase of 20·5 per 1,000. The lowest rates of prevalence are observed in the Western and Bangalore districts, and amount to 10·7 and 9·7 per 1,000 respectively. In the remaining districts the Eastern and that of Hyderabad gave ratios of 35·2 and 39·7 per 1,000 respectively.

*Cholera* shows 6 attacks and 2 deaths during the year as compared with 12 attacks and 10 deaths in the preceding year, the ratios of admission and mortality being ·6 and ·19 per 1,000 against 1·1 and 1·02 per 1,000 in 1884. Abstract XXVI. gives a table taken from the report of the Principal Medical Officer, showing the stations at which the admissions and deaths from cholera took place in each of the four quarters of the year. It will be seen that 4 of the cases and both the deaths took place in the third quarter of the year and

one in the first and second quarters respectively. In 1883 the greatest incidence of the disease took place in the third quarter, and in 1884 it was equal in the third and fourth quarters. Of the 6 cases, 4 occurred at Secunderabad, one case proving fatal; one at Toungoo, fatal; and one at Kamptee. At the two former stations cholera was epidemic at the time, but the case at Kamptee was sporadic, as the cantonment and surrounding country were free from the disease.

*Other diseases* of the febrile group caused 12 admissions, equal to a ratio of 1·1 per 1,000, which is about the average, though higher than in the previous year. The cases were 5 of erysipelas, one of mumps, and the remainder influenza.

*Diseases of the Constitutional Group.*—Under this head are returned 1,907 admissions and 17 deaths, including 4 of invalids; the ratios of admission and mortality, therefore, were 183·1 and 1·63 per 1,000 respectively, the former being higher than the ratio in the preceding year by 17·5 and than the average rate by 14·9 per 1,000, while the latter is higher than the last year's rate by ·98 and than the average rate by ·57 per 1,000. The increase in admission rate is chiefly due to the prevalence of primary syphilis.

*Rheumatism* caused 304 admissions, the ratio per 1,000 being lower than in the preceding year by 2·2, and fractionally below the average rate. Among the total number of cases 42 were acute rheumatism, from which also there was one death. As in the preceding year, the greatest prevalence of rheumatic affections occurred in Hyderabad. The smallest ratio of prevalence was 15·1 per 1,000 in the Western district. The prevalence of rheumatic affections declined in the Burmah, Western, and Bangalore circles, but increased in the remainder.

*Primary Syphilis* caused an admission rate of 123·3 per 1,000, which exceeds that in the preceding year by 21·9, and the mean rate of the previous six years by 18·1 per 1,000. The ratio of admission for secondary syphilis, 21·2 per 1,000, has, on the other hand, declined in both these comparisons, in the former by 4·0 and in the latter by 2·3 per 1,000. The highest ratios of prevalence of primary syphilis among the different circles are found, as in the previous year, in the Bangalore and Eastern circles, 210·7 and 174·8 per 1,000; the lowest, 28·1 per 1,000, being in the Nagpore circle. The highest ratio of prevalence of secondary syphilis in any division was 30·9 per 1,000 in the Eastern, and the lowest, 3·9, in that of Nagpore. The ratios of prevalence of both forms of the disease were high at the dépôts. The prevalence of primary syphilis increased in all the administrative districts, except in the Western and Nagpore districts. The increase in the Bangalore and Eastern districts was considerable, amounting to 74·1 and 34·6 per 1,000 respectively. Secondary syphilis increased in frequency in the Eastern, Western, and Bangalore districts, but decreased in the remainder. The ratio of admission for all forms of venereal disease, including gonorrhœa and its sequelæ, amounted to 302·1 per 1,000, which is in excess of the rate in the previous year by 41·9, and of the mean rate for the preceding 6 years by 55·6 per 1,000. The ratio of constant inefficiency from these affections equalled 22·47 men per 1,000 as compared with 18·38 in the foregoing year and with an average of 18·07. Among the different circles the highest rate of prevalence of all forms of venereal affections was 411·2 per 1,000 in the Bangalore circle, and the lowest, 217·2, in Burmah. In the preceding year the highest rate was in the Eastern division, followed by the Bangalore division; the lowest rate was also in Burmah.

*Tubercular diseases* caused 79 admissions and 12 deaths, including 3 of invalids; the ratio of admission, 7·6 per 1,000, is above the rate in the preceding year by 2·2, and above the average by 1·3 per 1,000; the mortality rate, 1·15 per 1,000, is considerably increased in both these comparisons. The highest ratios of admission for these affections are observed in the Eastern and Bangalore divisions, the lowest in the Western district. The ratios of admission and mortality are very high in the dépôts, owing to invalids from the plains being sent there for treatment. Of the admissions 49 are returned as cases of phthisis pulmonalis, and 14 as tubercular hæmoptysis; 11 of the deaths, including 3 of invalids, were due to phthisis pulmonalis and one to tubercular peritonitis.

*Other diseases* of the constitutional group show 19 admissions, principally for anæmia, but there were 2 cases of general dropsy, one of cancer, which



Madras.

proved fatal, and one of diabetes. A death of an invalid also occurred from diabetes.

*LOCAL DISEASES.*—*Diseases of the Nervous System* caused 163 admissions and 9 deaths, being in the ratios of 15·7 and ·86 per 1,000, as compared with 14·8 and ·93 per 1,000 respectively in the previous year, and with average rates of 15·3 and 1·32 per 1,000. The greatest prevalence of nervous affections was 26·8 per 1,000 in the Hyderabad Force, and the least, 3·9, in the Nagpore Force; compared with the rates in the preceding year considerable increase is observed in the former and considerable decrease in the latter. Among the admissions were 92 for some form of neuralgia, 25 for mental disease, 14 for sunstroke, 13 for epilepsy, and 7 for paralysis. The deaths were due to sunstroke in 4 instances (two occurring at Secunderabad and one at St. Thomas' Mount and Thayetmyo respectively), to meningitis in 3 instances, and in one case each to encephalitis and myelitis.

*Diseases of the Eye* caused an admission rate of 14·4 per 1,000, differing only fractionally from the mean rate, but above the rate in the foregoing year by 1·8. Of 150 admissions 113 were for simple conjunctivitis.

*Diseases of the Ear* were more prevalent than usual, the ratio of admission, 16·3 per 1,000, exceeding the average rate by 5·0, and being somewhat higher than the previous year's rate; five sevenths of the admissions were for simple inflammation of the external meatus.

*Diseases of the Circulatory System* caused 100 admissions and 8 deaths, including that of an invalid; the ratio of admission was 9·6, and that of mortality ·77 per 1,000; the former is lower than the ratio in the previous year by 5·0, and than the average ratio by 8·3 per 1,000; the mortality rate, however, is increased in both these comparisons. The highest ratio of prevalence, 19·6 per 1,000, is observed in the Western district; the lowest, 1·0, in the Nagpore circle. The admissions comprised 74 for palpitation, 19 for valve disease, and 3 for hypertrophy of the heart, also one for aneurism of the abdominal aorta, angina pectoris, varicose veins, and syncope respectively. There were 6 deaths from valvular disease of the heart, one from syncope, and one, in an invalid after arrival at home, from aneurism of the thoracic aorta.

*Diseases of the Absorbent System* gave a ratio of admission equal to 34·5 per 1,000, being higher than in the previous year by 2·7 and than the average rate by 3·9 per 1,000. These were most prevalent in the Bangalore circle and least so in the Hyderabad Force. Decrease of prevalence is observed in the Hyderabad Force and the Eastern and Western districts, but increase in the remaining districts. The total number of admissions was 359, out of which 344 were due to inflammation or suppuration of the inguinal glands.

*Diseases of the Respiratory System* caused 345 admissions and 4 deaths, being in the ratios of 33·1 and ·38 per 1,000 respectively. Compared with the corresponding ratio in the previous year an increase of 6·7 is observed, and in comparison with the average rate an increase of 2·0 per 1,000. The highest ratio of prevalence of respiratory diseases in the various administrative circles was 61·9 per 1,000 in Burmah, and the lowest, 6·8, in the Nagpore circle. In the latter there is a considerable decrease of prevalence, equal to 13·8, as compared with the preceding year, and in the Western circle there is a fractional decrease; in the remaining districts an increase is observed, most marked in Burmah, where it equalled 23·1 per 1,000. Of the total number of admissions, 298 were due to bronchial affections, 15 to pleurisy, 13 to pneumonia, and 13 to asthma; 3 of the deaths were due to pneumonia, and one to pulmonary extravasation.

*Diseases of the Digestive System* caused 2,424 admissions and 19 deaths, and the ratio per 1,000 consequently equalled 232·8 and 1·83 respectively. Compared with last year's return the admission ratio shows a small increase, 3·6 per 1,000, and in comparison with the mean rate for the preceding six years a decrease of 5·3 per 1,000. The mortality rate has declined in both these comparisons, in the former by ·95 and in the latter by 1·4 per 1,000. The highest ratio of prevalence of digestive affections in any of the administrative circles was 290·8 per 1,000 in Burmah, followed by 264·0 in the Hyderabad Force; as in the preceding year, the lowest ratio occurred in the Nagpore circle, and equalled 100·8 per 1,000. Compared with the return for the preceding year decrease of admission rate has occurred in the Eastern district equal to 147·6, and in the Nagpore Force to 41·0 per 1,000, while increase is observed

in the remaining circles, varying from 62·4 per 1,000 in Burmah to 14·3 in *Madras*, Hyderabad. The highest mortality rate was 2·13 per 1,000 in the Eastern district, and the lowest, ·89 in the Western. With the exception of the Bangalore division, in which the rate 1·39 compares with *nil* in the previous year, a decrease of mortality is observed in all the different districts. In the depôts the admission rate, 347·4 per 1,000, has declined by 45·1, and the mortality rate, 4·11, by 2·82. The principal causes of admission were dysentery 567 cases, dyspepsia 531, diarrhœa 430, hepatic affections 416, and tonsillitis 155. The deaths were due to dysentery in four cases, and in the remainder to hepatic diseases; the cases being returned as hepatitis 8, abscess of liver 4, cirrhosis 2, and jaundice 1.

Abstract XXVII. shows the prevalence of dysentery, diarrhœa, and hepatitis in each of the administrative circles of the command during the year, and Abstract XXVIII. the prevalence and mortality from these diseases in each quarter of the year. With regard to dysentery it will be observed in these tables that the admissions were in the ratio of 54·4, and the deaths in that of ·38 as compared with 55·7 and ·37 per 1,000 in the preceding year. Of the different divisions the Western and Eastern show the highest rates of prevalence, 100·7 and 90·9 per 1,000 respectively, the rates in the remaining circles being considerably lower. This disease was most prevalent in the third quarter of the year, next in the fourth, and least in the second. The ratio of admission for diarrhœa was 41·3 per 1,000, a slight decline from the rate in 1884. In the various districts the ratio of prevalence ranged from 55·5 in Burmah to 16·5 in the Nagpore circle. The disease was most frequent in the second quarter of the year, then in the third, and least in the fourth. Hepatitis and hepatic abscess caused an admission rate of 29·5 per 1,000, and a mortality rate of 1·15, as compared with 28·7 and 2·13 per 1,000 in the previous year. The Eastern district, as in the foregoing year, shows the greatest frequency of hepatic disease, the ratio being 47·3 per 1,000; the least frequency was in the Nagpore circle, the ratio being 10·7. The mortality rate varied from 1·89 per 1,000 in the Eastern to *nil* in the Nagpore district. The greatest seasonal prevalence of hepatic affections was in the third quarter of the year, next in the first, and then in the second and fourth with almost the same rate of frequency.

*Diseases of the Urinary System* caused a ratio of admission equal to 171·6 per 1,000 as compared with 147·6 in the preceding year, and with 126·9 per 1,000, the mean rate of the previous six years. The ratio of admission for gonorrhœa and its sequelæ alone was 157·6 per 1,000, which is an increase of 24·0 on the last year's rate, and of 39·8 on the average rate. The greatest prevalence of gonorrhœal affections was in the Nagpore circle, where syphilis was least prevalent; the ratio reached 213·2 per 1,000. The districts of Hyderabad and Bangalore, as well as the Eastern, show high ratios, the Western and Burmah showing the lowest. Prevalence has increased in all the administrative circles, except the Western, but particularly in the Nagpore circle, the increment being equal to 52·0 per 1,000. The ratio of admission for other diseases of the urinary system, 14·0 per 1,000, is above the average rate, but the same as the rate in the previous year.

*Diseases of the Generative System* were nearly equal in frequency to the average rate, 14·0 per 1,000, and slightly above the rate in the preceding year. *Diseases of the organs of locomotion and diseases of the cellular tissue* gave admission rates of 7·5 and 19·3 per 1,000 respectively. They are rather above the average rates, as well as the corresponding rates, in the preceding year.

*Diseases of the Cutaneous System* were the cause of an admission ratio of 95·9 per 1,000, being higher than the average ratio by 16·9 and than last year's rate by 2·6 per 1,000. As in the preceding year, by far the greatest prevalence of these affections was in the Eastern district, and was in the ratio of 156·7 per 1,000; the lowest ratio 77·5 was in the Nagpore circle. Considerably more than half the admissions were due to ulcers and boils, and the remainder were of a very varied character and do not demand special notice.

*Debility* caused 157 admissions, equal to a ratio of 15·1 per 1,000, which is below the average rate by 13·2, and the previous year's rate by 5·3 per 1,000. One death is recorded under this head.

*Poisons.*—Thirty-five admissions and 1 death are recorded, or 3·4 and ·10 per 1,000 respectively against 2·3 and ·09 in the previous year, and average

*Madras.*

rates of 2·9 and 1·7 per 1,000. Of the admissions 29 were due to delirium tremens, and 6 to alcoholic poisoning. One death from the latter is recorded.

*Injuries.*—One admission and 7 deaths are returned under general injuries. The admission was for a case of multiple injury, a gunner at Bangalore, having fallen from his horse on parade, being run over by the gun-carriage; the case terminated favorably. The deaths were all due to drowning, in six cases accidental; but it was uncertain whether the seventh was suicidal or accidental; the man had been, it is stated, mentally depressed, and the body was found in a well.

Injuries of a local character caused 1,380 admissions and 9 deaths, being in the ratios of 132·5 and ·86 per 1,000, both above corresponding ratios in the preceding year as well as above the average rates. The great majority of the admissions comprised contusions, wounds, and sprains, six sevenths of the total number being due to these causes. Among the remainder were 58 cases of fracture, 12 of dislocation, 4 of concussion of the brain, 8 of accidental gunshot wound, 1 self-inflicted while insane, and 1 of homicidal gunshot wound. The latter occurred at Rangoon, and proved fatal, and of those returned as accidental two were self-inflicted; the case self-inflicted while insane was an attempt at suicide, but the man only succeeded in blowing away part of his lower jaw and face, and he eventually recovered. There were also 6 admissions for injuries in action, received in the suppression of the Moplah fanatics in the Malabar district. The deaths resulting from local injuries were as follows:—Two from fracture of the skull, one occasioned by a fall from a barrack-room window into a brick drain, and the other by a fall from a pony; and seven from gunshot, of these one case, homicidal, has already been alluded to, one case was accidental, while out shooting game, and five were suicidal. In three of these cases of suicide by gunshot it is stated that the act was committed while in a condition of temporary insanity. In the fourth case the cause of suicide was not known, but it is said that the man had been drinking hard for a week previously. In the last case no motive is assigned; the man is stated to have been quiet, inoffensive, and temperate, and had shown no depression of spirits.

The surgical operations performed comprised two of aspiration of abscess of the liver, one of extraction of a foreign body from the tongue, after a gunshot wound, one of amputation of the thumb, necessitated by gunshot wound, and several other minor operations.

*Invaliding.*—There were 251 men invalided home during the year, and 145 were finally discharged the service as medically unfit, being in the ratios of 24·10 and 13·93 per 1,000 respectively. Compared with the corresponding rates for the preceding year, a decrease of 8·27 is observed in that of invalided home, and one of 50 per 1,000 in that of final discharge; and in comparison with decennial average rates, the decrease in the former case amounts to 13·86 and in the latter to 2·31 per 1,000.

The causes of invaliding to England were chiefly as follows:—Fever, 2 cases; rheumatism, 7, or ·67 per 1,000 of strength; secondary syphilis, 17, or 1·63 per 1,000; and tubercular diseases, 20, or 1·92 per 1,000. Among local diseases, affections of the nervous system necessitated the invaliding of 32 men (including 19 for mental disease), or 3·07 per 1,000, rather higher than in the previous year. The ratio of invaliding for diseases of the circulatory system was 2·30 per 1,000, which is considerably below the average rate, 4·56, and the rate in the previous year, 4·81 per 1,000. Among the 24 men invalided for these affections 11 were suffering from palpitation, 8 from valve disease, 2 from hypertrophy of the heart, and 2 from aneurism. Respiratory affections caused the invaliding of 8 men, or ·77 per 1,000. Under diseases of the digestive system 60 invalids are shown, equal to 5·76 per 1,000 of strength, which is below the average rate, though fractionally higher than the rate in the previous year. Among the cases invalided were 25 of hepatic affections, including 5 of abscess of the liver and 25 of dysentery. Diseases of the organs of locomotion show an invaliding rate of 1·34 per 1,000, due to 14 cases, of which 6 were synovitis. The ratios of invaliding in the remaining orders of local diseases were fractional. 29 men were invalided for debility, equal to a ratio of 2·79 per 1,000, which is considerably below the average rate and that in the preceding year. The number of men invalided for injuries was 12, or 1·15 per 1,000.

The principal causes of final discharge as medically unfit for further service were secondary syphilis, 8 cases, or  $\cdot 77$  per 1,000; phthisis pulmonalis, 20 cases, or  $1\cdot 92$  per 1,000; nervous affections, 21 cases (17 being mental disease), or  $2\cdot 02$  per 1,000; diseases of the circulatory system, 19 cases, or  $1\cdot 83$  per 1,000, of these 10 cases were valve disease, and 2 hypertrophy of the heart; diseases of the digestive system, 12 cases, or  $1\cdot 15$  per 1,000, half the cases were hepatitis; debility, 21 cases, or  $2\cdot 02$  per 1,000; and injuries, 9, or  $\cdot 86$  per 1,000. Compared with the return for the preceding year, an increase is observed in discharge from the service on account of secondary syphilis, tubercular diseases, nervous affections, and debility; but a decrease has occurred in discharge on account of diseases of the circulatory and digestive systems.

In Abstract XXIX. will be found a table, taken from the report of the Principal Medical Officer, showing the comparative mortality and invaliding among officers, non-commissioned officers, and men during the year under report and for the 10 preceding years. It is observed that during the year 1885 the highest mortality rate in the three grades was  $18\cdot 47$  per 1,000 among non-commissioned officers, and the least,  $7\cdot 66$ , among private soldiers; the same order of mortality in the three grades is found to obtain in the mean rates for the preceding decennial period; but comparing the ratios of the year under report with average rates, a decrease is observed in all three grades, amounting to  $5\cdot 03$  in the case of officers,  $\cdot 75$  in that of non-commissioned officers, and  $4\cdot 49$  per 1,000 in that of privates. With regard to invaliding, the highest ratio during the year occurred among officers, and was  $51\cdot 41$  per 1,000, followed by  $41\cdot 76$  among non-commissioned officers, and  $20\cdot 61$  among privates. The mean ratios for the preceding 10 years were in the following order:—first officers, then privates, and lastly non-commissioned officers. Compared with average ratios, invaliding among officers has declined by  $18\cdot 53$ , and among privates by  $16\cdot 70$  per 1,000, but has increased among non-commissioned officers by  $8\cdot 63$  per 1,000.

In Abstract XLVI. will be found a return, furnished by the Principal Medical Officer, showing the comparative sickness, mortality, and invaliding of men who extended their service in India and those who had not in the Presidency for the year 1885.

From this it will be seen that the proportion of sickness, mortality, and invaliding among those who were completing their extended service is less than that of the men of shorter service who were serving under the ordinary conditions.

**Officers.**—The average strength of officers was 295; there were 235 cases of illness, 3 deaths in the country, and 20 officers were invalided to England during the year. The ratio of sickness per 1,000 of strength was  $796\cdot 6$ , that of mortality  $10\cdot 17$ , and that of invaliding  $67\cdot 79$ . Compared with the corresponding ratios in the preceding year, a decline is observed in all, being  $93\cdot 8$  per 1,000 in the case of admission,  $3\cdot 53$  in that of death, and  $17\cdot 82$  in the invaliding rate. Eruptive fevers were represented by a severe case of small-pox at Bellary, which, however, eventually recovered. Enteric fever caused 5 attacks; 3 of the cases occurred at Secunderabad, one at Kamptee, and one at Bangalore. Other continued fevers caused 35 attacks of illness, being less prevalent than in the preceding year; and paroxysmal fevers caused 30 attacks of illness, of which 9 were cases of remittent fever. 14 cases of illness are shown under the constitutional group of diseases, 9 of which were due to some form of rheumatism. Among local diseases the principal causes of illness were dysentery 14 cases, hepatic affections 10, dyspepsia 8, and cutaneous diseases 16 cases. 40 cases of local injury are returned, among which were two cases of concussion of the brain and three of fracture. All the deaths occurred at Secunderabad; one was due to hepatic abscess in an officer who had just previously had a prolonged illness from enteric fever, and the other two deaths were those of two young officers who were killed by lightning. The causes of invaliding are shown as debility in 9 cases, hepatic disease in 3, and enteric fever, gout, phthisis pulmonalis, sunstroke, dyspepsia, dysentery, diarrhoea, and varicose veins in one case respectively.

**Women.**—The average strength of women during the year was 900, and the number of admissions into hospital, exclusive of 243 cases of childbirth, 614, which is equal to a ratio of  $682\cdot 2$  per 1,000, being lower than in the preceding year by  $46\cdot 1$ . The ratio of mortality,  $13\cdot 33$  per 1,000, due to 12 deaths, is

*Madras.*

*Madras.*

higher than that in the preceding year by 2·06. Febrile diseases caused 65 admissions, equal to a ratio of 72·2 per 1,000, which shows a marked decline from that in the preceding year. Among the cases were two of measles, one of enteric fever, 38 of other continued fevers, 21 of paroxysmal fevers, including two of remittent fever, one of which was fatal, also a fatal case of puerperal fever, and one fatal case of cholera. The constitutional group of diseases caused 46 admissions, or 51·1 per 1,000; among the cases were 16 phthisis pulmonalis, 14 of rheumatism, and 10 of secondary syphilis, from which also a death is returned. Among local diseases, affections of the nervous system caused an admission rate of 18·9 per 1,000, and one death is recorded from heat apoplexy. Diseases of the circulatory system were at the rate of 10·0 per 1,000; among the cases were four of valve disease of the heart, two of them fatal. Respiratory diseases caused an admission rate of 28·9 per 1,000; the majority of the cases were bronchial affections, and one death is returned from bronchitis. Diseases of the digestive system caused 158 admissions, being in the ratio of 175·5 per 1,000, as compared with 136·4 per 1,000 in the previous year. The principal causes of admission were dyspepsia and diarrhoea; and 19 cases of dysentery and 9 of hepatitis are also returned. Two deaths are recorded, one from gastritis, and the other from hernia. Affections of the generative system caused 86 admissions, the ratio per 1,000 being 95·5, which has declined from that in the preceding year by 8·2. There were 23 cases of abortion, of which one proved fatal. The admissions for general debility numbered 129; the ratio per 1,000 was, therefore, 143·3, as compared with 224·3 in the foregoing year; one death is returned under this head. In the remaining orders of diseases the admissions were not numerous, and the cases do not need special notice.

*Children.*—The average strength of children during the year was 1,851, the number of admissions into hospital 1,175, and of deaths, 59. The admission ratio, therefore, was 634·8, and the mortality ratio 31·87 per 1,000, as compared with 621·1 and 31·39 per 1,000 in the preceding year. Febrile diseases were less prevalent among children than in the previous year, the ratio of admission, 148·5 per 1,000, having declined by 32·0. Among 275 admissions there were 93 for eruptive fevers, of these 5 were cases of small-pox, one of which was fatal, two of the cases occurred at Bellary, two at Cannanore, and one at Kamptee. There were also 79 cases of measles, more than half of which occurred at Secunderabad. Enteric fever caused 4 admissions, one at Bangalore, and 3, one of which was fatal, at Secunderabad. Other continued fevers caused 120 admissions, and paroxysmal fevers, 22; among the latter were 6 cases of remittent fever. One fatal case of cholera occurred at Poona-mallee; the disease existed at the time among natives in the neighbouring villages. Constitutional diseases caused only 21 admissions, equal to 11·3 per 1,000; 11 of the cases were scrofulous affections. Among local diseases there were 31 cases of nervous affections, equal to 16·75 per 1,000; 22 of the cases were convulsions, and there was one case of hydrophobia in a boy of 10 years old, who was bitten at Bangalore about two months before by a dog supposed at the time to be rabid; the boy was attacked on 13th and died on 15th January. Ophthalmic affections were at the rate of 75·09 per 1,000, the great majority of the cases were simple conjunctivitis. Respiratory affections caused 189 admissions, equal to 102·1 per 1,000, almost identical with the ratio in the preceding year. Nearly all the admissions were due to bronchial affections. Diseases of the digestive system caused an admission rate of 160·4 per 1,000, differing from the rate in the previous year only by a decline of 4·9. The principal causes of admission were diarrhoea, dysentery, and teething. Cutaneous affections caused an admission rate of 30·2, and debility one of 56·7 per 1,000. The causes of death, in addition to those already mentioned, are returned as follows: convulsions 9 cases, respiratory diseases, debility, and diarrhoea 7 cases each, premature birth and teething 6 each, tubercular diseases 3, and secondary syphilis, hydrocephalus, epilepsy, valve disease of heart, tonsillitis, dysentery, jaundice, congenital hydrocele, hæmorrhage, and asphyxia by drowning one case respectively.

*SANITARY CONDITIONS.*—The Principal Medical Officer reports that the general health of the British troops in the command during the year may be considered to have been satisfactory, though it does not compare favorably with the preceding year, yet it does so with the previous 10 years. Cholera

and small-pox were prevalent among the civil population, yet only six cases of *Mudras*. each of these diseases occurred among the troops. Enteric fever, as has been already shown, was not so prevalent as in the preceding year, but the mortality was greater, and equalled 22·5 per cent. of the deaths from all causes. Nothing tangible has been elicited as to the causation of this disease in the Presidency.

With regard to the different *barracks* in the command the Principal Medical Officer reports as follows :—

*Eastern District.*—The lower rooms in the King's Barracks, Fort St. George, are scarcely fit for occupation during the hot weather, owing to the want of free perfilation of air through them; however, in consequence of the garrison being weak, very few men were accommodated in these rooms in the hot season. At St. Thomas' Mount, owing to the reduction of the strength of the garrison, it was not necessary to occupy the old north and south barracks, and the other occupied barracks are in good sanitary condition. At Poonamallee the barracks have been condemned as unsuitable for that depôt, and double-storied barracks are to be erected. Though these buildings are old they are in fair order, and afforded ample accommodation for the men sent there during the year.

*Bangalore and Ceded Districts.*—At Bangalore all the barracks are in good sanitary condition, though some are in close proximity to a densely crowded bazaar. At Wellington some changes were carried out with regard to the position of the sergeants' mess. A church is being built on a level spot above the married quarters. A bakery is also in course of construction.

*Belgaum and Western District.*—At Malliaporam, during the Moplah outbreak, there was, for a short time, some overcrowding, owing to a great increase of the strength. One of the rooms in the new barracks was not completed, and the old married quarters were, therefore, temporarily used. The barracks at Cannanore are faulty in construction, being too low pitched, and having only single narrow verandahs whereby rain is liable to drift in on the monsoon side. The barracks at Belgaum are favourably reported on.

*Hyderabad Subsidiary Force.*—The defects noted last year at Secunderabad still exist; the want of trees to check the force of the wind during the monsoon, and of proper masonry drains around the barracks to carry off the rain-water. Young trees were, however, planted during the year. The disused water room near the main guard is being converted into a magazine. The four end quarters in No. 4 block of married quarters in the 2nd British infantry lines were converted into a temperance hall.

*Nagpore Force.*—The construction of the artillery cook-house is said to be faulty, and the place is so dark that unless a fire is burning it is difficult to see. The cook-house of the infantry sergeants' mess was re-modelled during the year, and the roof of the shoemakers' shop in the infantry lines was dismantled and reconstructed.

*British Burmah Division.*—The barracks in this division have been favorably reported on.

*Hospitals.*—At Rangoon a new station hospital was opened during the year. It consists of four large blocks, a large kitchen, with covered way leading to central block, two rooms for quarters for army hospital native corps, laundry, mortuary, dry earth shed, &c. Three of the main buildings comprise the hospital for men, and the fourth is the women's hospital. The first three blocks are built in *echelon* on the same level, the fourth or female hospital block is in a line with No. 3 block, but on a lower level, and at a greater distance than the other blocks, which communicate by covered ways. These buildings all face south-west, so that they are fully exposed to the wind of both monsoons. The blocks are built of teak wood, and rest upon an asphalted basement of brick and lime rubble. No. 2, or the central block of the men's hospital, has a large porch, the upper floor of which forms a reading room and library. In this block are the various offices for administration. On the upper floor are three wards, with attendant's room and lavatory, the central ward furnishes accommodation for 16 patients, and the two smaller for four each. No. 1 and No. 3 blocks are similar, except that they do not possess a central porch, and No. 1 block is somewhat shorter, and consequently has

*Madras.*

accommodation for only 22 patients. No. 3 has the same accommodation as No. 2 block, 24 patients. In all the superficial area and cubic space are ample. No. 4 block, or the female hospital, covers a slightly smaller area than the others, but it has, like No. 2, a central porch, and consequently an extra upper room. The upper floor is divided into two large wards for six patients each, a small ward for two, with nurses' and attendants' rooms. It is an elegant, cheerful, and comfortable building. Water supply for these buildings is thus arranged for. At each extremity of each building is provided a 60-gallon tank, which gives an ample supply to the bath rooms and lavatory. If filled only once daily, and if the hospital is full, these tanks supply six gallons of water for ablution purposes for each patient. The laundry and other outbuildings are reported to be satisfactory. A small ward in No. 1 block has been appropriated as an officers' ward, and it is said that it supplies a want which has been felt for years past.

All the hospitals in the Bangalore division and Ceded districts are admirably adapted in every way for the treatment of the sick, except the north station hospital, Bangalore, which, having been constructed many years ago, is not up to the modern standard either in arrangements or sanitary requirements. It consists of a single floor only, and the different blocks are too close together.

The designation of the hospitals at Secunderabad has been changed from the south, north, and Trimulgherry station hospitals to south, central, and north respectively. There are quarters for servants at the south station hospital, but only a few at the central and north station hospitals. A general female hospital is much needed, but it will be difficult to produce a site central enough for all.

The new hospital at Malliapooram has been in occupation some time, and, in every respect, is well adapted for the treatment of the sick. The dining-room at one end and the office at the other have each a flat roof, with a loop-holed *sarapet* for purposes of defence, and these roofs therefore leak. The matter has been reported upon. The hospital at Cannanore had its accommodation somewhat strained during the monsoon, now and then, when tents could not be pitched. The reports in the hospital and its arrangements at Kamptee are favorable. The disused guardroom at the south station hospital, Secunderabad, was converted into a hospital ward for military prisoners.

*Drainage and Conservancy.*—The system of drainage at Bellary is said to be defective, in consequence of the almost dead level of the station. At Secunderabad nothing was effected as regards the abolition of wet cultivation close to the cantonment, as had been recommended. It is stated that in Fort St. George the men's latrine is close and confined, and therefore more or less defective, and there was a difficulty in getting the men and the sweepers to use, during the rainy season, sufficient dry earth to deodorise the soil. At Kamptee a similar difficulty has also been complained of.

*Water Supply.*—The supply for Fort St. George is conveyed in pipes from the "Seven wells." The medical officer in charge reports that "albuminoid ammonia exists to a great extent in the water from the 'Seven wells,' and although it is filtered through McNamara's filter before being used for drinking purposes by the troops and their families, still it cannot be considered free from suspicion."

The water supply at Bangalore was unsatisfactory, as the sources from which the Ulsoor tank receives its supply are not sufficiently protected. This has engaged the attention of Government, and schemes for the protection of the water from pollution are under consideration, but as yet nothing practical has been done.

The supply at Calicut was sufficient in quantity, but the chemical examiner pronounced it suspicious in quality. Precautions are taken to have it carefully filtered before being used.

*Cooking and Rations.*—There has been no change in the rations except at St. Thomas' Mount and Madras, where Chicago beef was issued to the troops towards the end of the year. At Bellary the want of variety in the vegetable ration (potatoes and onions) is much felt. It has been proposed to open out a vegetable garden at Ramandroog, when the troops from Bellary visit that station during the hot weather months. This will afford occupation for the troops stationed there, and provide a good supply of fresh vegetables for Bellary.

In November the question of the insufficiency of a half ration for boys under 16 years of age was raised, and referred to the Principal Medical Officer, who stated that he considered it desirable that a full ration should be issued to these lads. Madras.

**Canteens.**—The country-made beer now issued to the troops instead of English beer is not liked by the men generally, although it is much lighter and a better drink. The Principal Medical Officer, British Burmah, reports that at Thayetmyo, where intemperance was seriously interfering with the general health of the men, it was recommended that the canteen should not be opened before noon; the suggestion was accepted, and the general health and the sick returns showed a decided improvement in consequence. The coffee shops in the different stations worked well during the year, and gave general satisfaction.

### III.—BOMBAY.

The average strength of warrant officers, non-commissioned officers, and men serving in the command during the year was 11,650; there were 17,005 admissions into hospital, and 288 deaths, including those of 8 invalids after leaving the country; and 780·56 men were constantly sick. The ratio of admission, therefore, was 1459·6 per 1,000, that of mortality 24·72, and that of constantly sick 67·00 per 1,000. Compared with the corresponding average rates for the previous year an increase of 44·3 per 1,000 is observed in admission ratio, one of 4·96 in the rate of mortality, and one of 2·30 per 1,000 in that of constant inefficiency through sickness; and, compared with similar average rates for the preceding 10 years, the ratio of admission has declined by 110·1, but that of death has increased by 7·90, and that of constantly sick by 5·30 per 1,000.

The average sick time for each soldier was 24·46 days, and the average duration of each case of sickness 16·76 days; these differ only fractionally from the corresponding periods in the previous year, but compared with the average length of these periods in the preceding 10 years the former is longer by 1·94 days and the latter by 2·42 days.

The total loss for the year by deaths and discharge from the service by invaliding was 428 men, equal to a ratio of 36·74 per 1,000, which is higher than that in 1884 by 6·90 per 1,000.

In Abstract No. XXXI. is a table, taken from the report of the Principal Medical Officer, Surgeon-General W. A. Thompson, M.B., showing the average strength, admissions, deaths, &c. in the different stations in the command. As in the preceding year, the highest admission rate in any station occurred in Quetta, 2206·3 per 1,000; this was followed by Hyderabad with 2196·1, and by Neemuch with 2149·9. The lowest rate, also, as in 1884, occurred in Belgaum, 860·8 per 1,000, Colaba being next above with 1005·5, and Deesa with 1048·0 per 1,000. The highest rate of mortality, excluding Sanitaria, &c., was in Quetta, and equalled 85·23 per 1,000; this high rate was due to an outbreak of cholera, to be presently alluded to. The next highest rate was 31·91 per 1,000 at Indore, followed by 23·98 at Deesa; mortality was least in Ahmednagar, the ratio being only 2·18 per 1,000; Satara and Asirgarh come next above with 7·81 and 8·13 per 1,000 respectively.

Comparing this table with that of the preceding year, increase of admission rate has occurred in 12 stations out of 18, excluding Sanitaria, and Khundwa which had an average strength of only two. Among the stations showing increase were Ahmedabad, Deolalee, and Poona, the increase amounting to 620·5, 395·5, and 260·9 per 1,000 respectively; and among the stations in which a decline of admission rate has taken place the greatest decrease is observed in Mhow, 550·7 per 1,000, Ahmednagar being next with 280·9, and Deesa with 194·9 per 1,000. With regard to mortality, the greatest increase, on account of the cause mentioned above, was at Quetta, 47·09 per 1,000, the next being at Indore, 31·91, and then 19·23 at Kolhapur. There was no mortality in the last two stations in the previous year.



*Bombay.*

Comparing the ratios of admission and mortality at the different stations with those of the average of the preceding 10 years, excluding Sanitaria, &c. as above, a decline of ratio of prevalence is observed in 13 out of 18 stations, the most marked being 841·3 per 1,000 at Colaba, 591·6 at Mhow, and 308·7 per 1,000 at Satara; of the stations in which an increase has occurred Quetta shows the greatest, 735·1 per 1,000, and next Hyderabad, 585·3, and Aden, 180·5 per 1,000. Mortality in this comparison has increased in the majority of the stations, principally in Quetta, Indore, and Deesa, by 59·56, 16·54, and 11·63 per 1,000 respectively, and declined chiefly in Nasirabad by 13·23 per 1,000, in Ahmednagar by 12·13, and in Ahmedabad by 11·81 per 1,000.

Abstract XLV. gives a table, taken from the report of the Principal Medical Officer, showing the more important of the health statistics of the different corps which served in the command during the year.

With regard to the different arms of the service it is observed that the admission rate in the cavalry was equal to 1221·5 per 1,000, in the artillery to 1446·2, and in the infantry to 1589·6 per 1,000. Compared with corresponding ratios in the previous year the rate in the cavalry has declined by 120·4 per 1,000, but those in the artillery and infantry have increased by 26·2 and 61·7 per 1,000 respectively. The death rate in the cavalry in the year under report was 6·71 per 1,000, that in the artillery 16·46, and that in the infantry 26·85 per 1,000; all these are in excess of similar rates in the preceding year, the first by 2·41, the second by 2·33, and the third by 13·17 per 1,000. Invaliding in the cavalry equalled 38·03 per 1,000, being slightly above the ratio in the previous year; in the artillery 39·36 per 1,000, also a slight increase; and in the infantry 25·71, a fractional decrease. The ratios of constantly sick in the cavalry and artillery, 65·93 and 65·51 per 1,000, show each a slight decline, but that for the infantry, 72·60 per 1,000, is increased by 3·00. With regard to individual corps in the various arms of the service, it is observed that there was only one cavalry regiment in the command, the 7th Dragoon Guards, quartered at Mhow; the ratios given above for the cavalry are, therefore, those of this particular regiment. In the artillery, taking batteries of fair average annual strength, the highest admission rate in any one battery was 2973·2 per 1,000 in F Battery, 2nd Brigade, quartered at Nasirabad, and the lowest, 618·3 per 1,000, in No. 2 Battery, 1st Brigade, Scottish Division, at Quetta, during nine months of the year. Mortality gave a high ratio, 111·11 per 1,000, dependent on 9 deaths in an average strength of 81, in No. 9 Battery, 1st Brigade, Northern Division, at Quetta; in several batteries no death occurred, and the lowest rate in any battery in which mortality did occur was 6·62 per 1,000 in B Battery, 2nd Brigade, quartered at Mhow. Invaliding was highest in E Battery, 1st Brigade at Kirkee, being equal to 106·19 per 1,000; in E Battery 2nd Brigade the ratio was as low as 12·99 per 1,000, this battery was quartered at Karachi; and in several batteries there was no invaliding. The greatest amount of constant inefficiency through sickness was 104·08 per 1,000 in No. 9 Battery, 1st Brigade, Northern Division, quartered at Quetta throughout the year, and the least also in Quetta, 33·28 per 1,000, in No. 2 Battery, 1st Brigade, Scottish Division. In the infantry the highest admission rate in any corps was 2818·6 per 1,000 in the 1st Loyal North Lancashire Regiment, quartered at Quetta, the lowest being 915·2 per 1,000 in the 1st Rifle Brigade at Belgaum. Mortality was highest in the 1st Oxfordshire Light Infantry, due to cholera, at Quetta, the ratio being 129·54 per 1,000. The Loyal North Lancashire Regiment also shows a high mortality, 56·78 per 1,000, at the same place and from the same cause; the lowest mortality ratio was 8·99 per 1,000 in the 2nd Gloucester Regiment, which was half the year at Poona and half at Ahmednagar. The greatest amount of invaliding was in the Loyal North Lancashire Regiment at Quetta, 44·16 per 1,000, the greatest amount of constant inefficiency, 115·96 per 1,000, was also in this corps. Invaliding was least in the 1st Oxford Light Infantry, and the lowest ratio of men constantly sick, 42·45 per 1,000, was in the 1st South Lancashire Regiment quartered at Aden.

The admissions, deaths, invaliding, &c. in the different classes and orders of diseases are given in Abstract XXX., and the relative prevalence of sickness and mortality from them in each of the administrative circles is shown in Abstract XXXII.

**GENERAL DISEASES.**—The ratio of admission for this class of diseases *Bombay.* amounted to 752·5 per 1,000, and that of mortality 12·96 per 1,000. Compared with corresponding rates in the preceding year, an increase of 104·3 is observed in the former, and one of 2·34 in the latter, but in comparison with similar average ratios for the preceding six years there is a decline in admission ratio equal to 168·5 per 1,000; the mortality rate, however, shows an excess of 6·05 per 1,000.

*Diseases of the Febrile Group* caused an admission ratio of 585·8 per 1,000, which is higher than that in the preceding year by 86·7 per 1,000, but lower by 183·1 than the average ratio for the preceding six years; the death rate 11·32 per 1,000 is increased in both these comparisons, in the former by 1·91, and in the latter by 5·91 per 1,000. The number of men constantly sick from febrile affections was equal to a ratio of 19·24 per 1,000, which is higher than that in the previous year by 2·75 per 1,000, but fractionally below the average rate. Febrile affections were more prevalent in Quetta than in any administrative circle, and the mortality from them was also greatest in that circle, the ratios being 1,319·4 and 52·50 per 1,000 respectively, greater than those in the preceding year by 504·5 and 34·83 per 1,000. The lowest rates of prevalence and mortality from fevers were, as in the previous year, in the Presidency circle, and scarcely show any variation from those in that year. Mhow also shows a comparatively low ratio of prevalence, 483·5 per 1,000, but the mortality rate, 6·99 per 1,000, has increased.

*Eruptive Fevers* caused 9 admissions and one death. The cases comprised one of small-pox, which recovered, one of scarlet fever, which proved fatal, three of measles, and two each of chicken-pox and cow-pox. The ratios of admission and mortality were ·8 and ·09 per 1,000, the former being lower than, but the latter the same as, the corresponding rate in the preceding year.

*Enteric Fever* caused 88 admissions and 30 deaths, being in the ratios of 7·6 and 2·57 per 1,000 respectively, as compared with 9·0 and 2·05 per 1,000 in the preceding year. The ratio of mortality to attack was 34 per cent. as compared with 23 per cent. in 1884. In Abstract No. XXXIII. is given a table, taken from the report of the Principal Medical Officer, showing the stations at which the admissions and deaths from enteric fever occurred in each quarter of the year. The first quarter shows 21 admissions and 6 deaths, the second 22 and 9 deaths, the third 28 and 9 deaths, and the fourth quarter 17 admissions and 6 deaths. Prevalence, therefore, was greatest in the third quarter, followed by the second; mortality to attack being greatest in the second quarter, and next in the fourth quarter.

In a special report on enteric fever amongst British troops in the command during the year the Principal Medical Officer gives a table illustrating the relative frequency of enteric fever at the different stations for the five years ending with that now under report. He points out that enteric fever has increased chiefly at Deolali, Belgaum, Poona, Nasirabad, Deesa, and Taraghar, and that a decrease has taken place at Aden, Ahmednagar, Karachi, and Quetta. With regard to seasonal prevalence he states that although in 1885 the influence of different seasons is not so distinctly marked as in previous years, yet the general conclusion is drawn from the past five years that the greatest number of cases occur in the third quarter of the year. However, in Karachi in the year under report, where the greatest number of cases in any one station occurred, 19 with 4 deaths, not one admission took place in the third quarter, 7 admissions occurring in the first quarter, 7 with 3 deaths in the fourth and 5 with 1 death in the second quarter. It is remarked that there was a greater prevalence of the disease in the artillery at this station than in the previous year, and this is attributed to the fact that a large number of young soldiers joined during the year. Of the 19 cases, 17 were between 20 and 24 years of age, and all occurred in men under four years' service in India; 12 being men of six months' service and under; and four in men under one year's service. With regard to causation the milk supply and water were suspected, and the sanitation of the latrines was defective, but no strong evidence of connexion between the disease and these causes was established. The disease is said to be endemic in the city of Karachi and is in great measure due to the cesspool system in vogue there. At Deesa there were 14 admissions and 4 deaths; in this instance, also, no admission took

*Bombay.*

place in the third quarter of the year, 6 admissions and 2 deaths occurred in the first quarter, 5 and one death in the second, and 3 and one death in the fourth. The increase in the number of cases in the year under report as compared with previous years was very marked, and a medical board was assembled to inquire into it, but their investigations failed to discover any causes bearing relation to the disease. At Quetta, also, there were 14 cases and 4 deaths, but in this instance the great majority of the cases, 11 with 3 deaths, occurred in the third quarter of the year, the remainder in the last quarter. In the previous year also four fifths of the cases occurred in the third quarter, and the remainder in the last, and in both years, in the months when enteric fever was most prevalent, there was also the greatest amount of sickness from other continued and remittent fevers. At Nasirabad there were 10 cases and 4 deaths, one half of which occurred in the first three months of the year, four cases in the third and one in the second quarter. It is stated that three of the cases were almost certainly contracted by men on the march, but in none of the other cases could the disease be satisfactorily traced. At Poona 8 cases and 5 deaths occurred; and all of them between 25th April and 15th August. Six of the admissions (of which three proved fatal) came from one regiment quartered in the Ghorpuri barracks, and there was a considerable amount of sickness in this corps from malarial and other fevers; the regiment was, therefore, moved from these barracks. In none of the 8 cases of enteric fever could the origin of the disease be traced to any particular insanitary cause, either in or near barracks. At Belgaum there were 7 cases with 4 deaths, and although careful investigation was made, no insanitary conditions were discoverable which could account for the occurrence of the disease. At Mhow there were 5 cases and 3 deaths, for these no cause is assigned. It is stated that there is reason to believe that not only the sickness but also the mortality from enteric fever was higher than here recorded, and that three fatal cases returned as remittent fever were probably cases of the former disease. At Deolali there were 3 cases, recoveries; they were all imported cases. In one case the patient was 18 years of age, and six months' service in India; in the second, 25 years old, and  $3\frac{1}{2}$  years' service; and the third was a man of 27 years of age, and nearly  $6\frac{1}{2}$  years' service in India. At Taragarh, also, there were 3 cases, which all recovered; this was the first occurrence of the disease since 1881. All the cases happened about the same time, in September, and came from the same barrack room, but it does not appear that any special cause for the disease was discovered. The remaining instances of the disease were single cases, occurring in Colaba, Indore, Ahmednagar, Neemuch, and Asirgarh respectively; the cases at the two first-named places proved fatal. No special mention is necessary concerning any of these cases.

The admissions for *other continued fevers* were 1,326 in number, with 4 deaths, being in the ratios of 113·8 and ·34 per 1,000 respectively. The ratio of admission differs very slightly from that in the preceding year, being only 1·2 per 1,000 in excess, and is almost identical with the average ratio for the preceding six years. The mortality rate compares favourably with last year as well as the average rate. The number of admissions were very nearly equally divided between simple continued fever and febricula; 677 of the former and 649 of the latter. All the deaths were returned as simple continued fever. The highest admission rate for these fevers was in the Sind district, 329·8 per 1,000, and the lowest, 41·9 per 1,000, in the district of Mhow. In the previous year also, the highest and lowest ratios of prevalence were in the same two districts. In Quetta a considerable decrease in rate of prevalence is observed, and a slight decrease in Mhow; in the remaining circles the ratio has increased.

*Paroxysmal fevers* caused 5,246 admissions and 12 deaths, being in the ratios of 450·4 and 1·03 per 1,000 respectively. Compared with the rates in the previous year, that of admission shows an increase of 85·1, and that of death a decline of ·27 per 1,000; but in comparison with average rates for the preceding six years a decrease in admission rate is observed, equal to 192·9, and one in mortality, equal to ·62 per 1,000. The ratio of constant inefficiency on account of malarial fevers was 14·30 per 1,000, which compares favourably with 15·45 per 1,000 the average rate, but is higher than the ratio in the previous year by 3·38 per 1,000. Of the total number of admissions 83

were for remittent fever, of which 12 cases proved fatal, 7 at Quetta. The highest ratio of prevalence of malarial fevers was 1,177·9 per 1,000 in the Quetta district, and is more than twice that in the preceding year; in Sind there was a ratio of 565·4 per 1,000, which is an increase of 213·7; and in Poona the ratio, 344·8 per 1,000, is increased by 99·0. In the Mhow division, on the other hand, the ratio of prevalence, 425·0 per 1,000, has declined by 166·5; and in the Presidency circle, the rate 141·2 is lower by 31·2. The ratio of prevalence in the Sanitaria, 417·6 per 1,000, also shows a decline, equal to 169·1 per 1,000. The mortality rate in the Sanitaria was 5·49, that at Quetta, 4·32, that among troops on the march, 1·89, and that at Mhow, ·95 per 1,000. With regard to Quetta, it is shown that the health of the troops in the early part of the year was good, but about the end of May malarial fever began to increase in frequency and was very prevalent in August, September, and October, at the end of which month health began to improve. The great diurnal changes of temperature that take place in this district are thought by some to be great factors in producing febrile disease. In Sind increase of malarial fevers was attributed, at Hyderabad, to the inundation into the low ground in the neighbourhood of the cantonment, but at Karachi there was also an increase, though there was neither inundation nor an average amount of rainfall. At Mhow the cases of malarial fever diminished considerably in number, and this improvement is attributed to the small rainfall, to careful adaptation of clothing to vicissitudes of temperature at certain seasons, and to the draining of a marsh in the vicinity of the infantry barracks.

*Cholera* caused 131 admissions and 85 deaths, being in the ratios of 11·2 and 7·30 per 1,000 respectively, as compared with 6·2 and 4·85 per 1,000 in the previous year, and with 1·6 and 1·2 per 1,000 respectively, the average of the preceding six years. The per-centage of deaths to attacks was 65, which compares favorably with 79 in 1884 and with an average per-centage of 175. In Abstract No. XXXIV. is a table taken from the report of the Principal Medical Officer, showing the stations at which the admissions and deaths took place in each quarter of the year. In the first quarter there was no incidence of the disease, but there were 61 cases and 39 deaths in the second quarter, the same number of cases and deaths in the third quarter, and 9 cases with 7 deaths in the last quarter. All the circles of administration, except that of Poona, were affected, Quetta severely, and the remainder slightly. Concerning the outbreak at Quetta, the Principal Medical Officer of the district, Brigade Surgeon A. F. Bradshaw, reports that the disease broke out on the 10th May at Rindli, a post in the Dadar plain, two miles to the east of the entrance to the Bolan Pass, and, after spreading widely at this place, it advanced up the pass, attacking every post in succession, reaching Mach, 45 miles off, on the 25th May. On the 3rd June, the first case among the troops in the Quetta valley occurred in the Oxfordshire Regiment, encamped about a mile from cantonments. Other cases quickly followed in the same regiment, and subsequently the disease appeared among the men in barracks and station hospital; in the latter there were 20 seizures. The total number of admissions among the men during the time the epidemic lasted, June to October, was 103, and there were 67 deaths. The disease was extremely fitful and erratic in its manifestations, successive cases appearing in opposite directions and reviving after lulls long enough to encourage hope of final cessation. The prevalence in the Oxfordshire Regiment was remarkably persistent in spite of numerous zigzag marches from east to west, west to north, and again to east. Eventually the regiment quitted the valley and the disease either died out or the limits of its sway were passed. The Rindli epidemic spread northward as well as westward up the Bolan, and developed extensively in the Hurnai route among the railway coolies, 1,400 having perished, according to official estimate. Ascending towards Pishin it intercepted the troops marching across the route on their way to the Ziarat range to the standing sanitarium camp. They had been hurriedly despatched from Quetta barracks to save them from the local cholera and it was hoped they would cross the Hurnai route safely to Kach. The cases fortunately were very few. With regard to the occurrence of cholera in the Mhow district, it is stated that the Mhow bazar was visited by a very severe outbreak at a most unusual period of the year, April and May. Special precautions were taken to prevent the extension of the disease to the

*Bombay.*

troops with the result that, though hundreds died in the bazar, the troops were the last attacked and the disease fell lightly on them; 3 cases occurring at Mhow with 2 deaths, 4 at Neemuch with 2 deaths, and one fatal at Indore. Two fatal cases at Khundwa were left by troops passing to Bombay. In the district of Sind it is reported that cholera appeared among the civil population but there were only two cases among the troops. These occurred at Karachi; both men had recently arrived in the station, one from Quetta, and the other from Kirkee; the former case proved fatal. In the Presidency district two cases occurred, one at Deolali and the other at Belgaum, both fatal; the former case was believed to have been contracted at Khundwa, though the disease was very prevalent in the neighbouring city. Cholera was also epidemic in the vicinity of Belgaum, but only the case alluded to occurred among the troops. 14 cases and 8 deaths are recorded among troops on the march, &c. Six cases and 2 deaths returned as such occurred at the convalescent hospital at Negandi, where some troops from Quetta were stationed from June to October; the remaining 8 cases occurred among marching troops, 4 cases and 3 deaths at camp Gwaliki; 2, both fatal, at camp Gulistan; and 2, with one death, at camp Sakhoi.

The admissions for *other febrile diseases* were 25 in number; among them, however, no death occurred. The admissions comprised 16 cases of erysipelas, 2 of farcy, both of which occurred at Nasirabad, 2 of mumps, and the remainder influenza.

*Diseases of the Constitutional Group* caused 1,942 admissions and 19 deaths, being in the ratios of 166·7 and 1·64 per 1,000 respectively. Compared with the return for the preceding year an increase of 17·6 per 1,000 has occurred in the admission rate, and one of ·43 in the death rate; and in comparison with the corresponding average ratios for the preceding six years an increase of 14·6 per 1,000 is observed in the former, and one of ·14 in the latter.

The admissions for the various forms of *rheumatism* numbered 318, the ratio per 1,000 of strength being 27·3, almost identical with that in the previous year, though below the average ratio by 6·2 per 1,000. Of the total number of cases, 66 were of the acute form, but no death occurred. Rheumatic affections were mostly prevalent in the Quetta circle (excluding Sanitaria) 45·1 per 1,000, and least so in Sind, 13·0 per 1,000. A decrease of prevalence of rheumatism occurred in the Presidency, Sind, and Poona circles; also in the Sanitaria; but an increase is observed in the Mhow and Quetta circles.

*Primary Syphilis* caused 1,150 admissions, and secondary syphilis 290, being in the ratios of 98·7 and 24·9 per 1,000 respectively, as compared with 90·1 and 19·0 per 1,000 in the preceding year, and with average ratios of 84·2 and 21·8 per 1,000. There is, therefore, a marked increase in these affections in both comparisons. The ratio of prevalence of primary syphilis varied from 152·2 per 1,000 in the Mhow district to 70·6 per 1,000 in the Presidency circle, but the ratios in the remaining circles are nearer the latter than the former. Increase of prevalence as compared with the previous year is noticed in the Mhow and Sind divisions, by 37·6 and 29·1 per 1,000 respectively, but a decline is observed in the remainder, most marked in the Quetta division, 25·1 per 1,000. Excluding Sanitaria, the ratio of prevalence for secondary syphilis was highest in the Sind circle, 34·9, and lowest, 17·0 per 1,000, in the Presidency. Prevalence has somewhat declined in the two districts just mentioned, but has increased in the remaining circles. Including gonorrhœa and its sequelæ, the total ratio of admission for all forms of venereal disease was equal to 242·6 per 1,000, which, though higher than the average similar rate for the previous six years by 7·0, is lower than the corresponding rate in the previous year by 14·8 per 1,000. The ratio of constant inefficiency from these diseases was 16·41 per 1,000, which is above the average rate by 1·71, but below the rate in 1884 by a fraction.

*Tubercular diseases* caused 93 admissions and 15 deaths, including three of invalids, being in the ratios of 8·0 and 1·29 per 1,000 respectively. The admission ratio is almost identical with that of the preceding year, but the death rate is increased by ·26 per 1,000; but both these ratios are slightly above the corresponding average rates. Of the admissions, 71 are returned as phthisis pulmonalis, and 18 as tubercular hæmoptysis. All the deaths were due to phthisis pulmonalis. Excluding Sanitaria, tubercular diseases were

most prevalent in the Presidency circle, and least so in the Sind circle. In the former case there was a slight increase, but in the latter a marked decrease as compared with corresponding rates in the previous year. Mortality was greatest in the Presidency district, followed by the Sind district, and least in the Poona circle. With the exception of Quetta, in which the ratio has declined, mortality increased somewhat in all the circles. *Bombay.*

*Scurvy* was the cause of 30 admissions, and *purpura* of one admission; the ratio per 1,000 being 2·7, nearly twice the average rate, and greater than that of the preceding year by ·9. 15 of the admissions occurred in the Poona district, 13 being in the cantonment itself; they happened in May and June, and their occurrence is attributed to the difficulty of procuring fresh vegetables in these months. The outbreak soon disappeared after the issue of lime juice.

Sixty admissions are recorded for *other constitutional diseases*, mostly cases of *anæmia*. Among the remaining cases were three of cancer with two deaths, and two of diabetes, one of which proved fatal.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused 242 admissions and 18 deaths, including that of an invalid. The ratio of admission was 20·8, and that of mortality 1·55 per 1,000. Compared with corresponding ratios for the preceding year, the former shows an increase of 3·0, and the latter a decline of ·13 per 1,000; and compared with average similar rates for the previous six years, the increase in admission rate equals 5·0, and the decline in the death rate ·23 per 1,000. Prevalence of nervous affections was greatest in the Presidency circle, and least in Quetta, the ratios being 37·4 and 11·1 per 1,000. In the former case there is a considerable increase and in the latter a similar decrease as compared with the preceding year: the rate for Mhow, 19·7 per 1,000, has also increased in this comparison by 5·1. Mortality, as in 1884, was highest in Sind; the rate being 4·06 per 1,000, and lowest in Quetta, ·62 per 1,000. With the exception of an increase of ·90 per 1,000 in that for Mhow, there is very little variation in mortality rates as compared with the previous year. Among the admissions were 31 for sunstroke, from which also there were 9 deaths, 81 for some form of neuralgia, 21 for paralysis, with one death, 44 for epilepsy, and 45 for mental disease. The ratio of admission for mental disease to strength was 3·9 per 1,000, which is more than twice that of the preceding year. Death was also due to apoplexy in 4 cases, and to encephalitis, meningitis, and cerebral tumor one case respectively.

*Diseases of the Eye* caused 146 admissions, of which 104 were due to simple conjunctivitis; the other causes of admission being of a varied character. The ratio of admission, 12·5, is below the average rate, and also below that in the previous year. Ophthalmic affections were more prevalent in the Poona circle, but less so in other circles, especially in that of Sind.

*Diseases of the Ear* caused an admission rate of 12·0 per 1,000, being a little above the average, as well as above the previous year's rate. In the Presidency, Poona, and Sind circles an increase of prevalence is observed, especially in the latter; 112 admissions out of 140, or four fifths of the total, were due to inflammation of the external meatus.

*Diseases of the Circulatory System* caused 183 admissions and 3 deaths, being in the ratios of 15·7 and ·26 per 1,000, respectively, which are below the corresponding ratios in the preceding year by 1·2 and ·11 per 1,000; and below similar average rates by 1·1 and ·36 per 1,000. The highest ratio of prevalence of circulatory affections in any circle was 38·5 per 1,000 in the Presidency; this is an increase of 22·4 on the previous year. In all other circles the ratio was much lower, being between 10·5 in the Poona circle and 7·6 per 1,000 in that of Mhow; and in each case a decline is observed as compared with the year 1884. Of the admissions, 109 were cases of palpitation, 60 valvular disease of the heart, 9 aneurism, one of hypertrophy of the heart, one of dilatation, and one of phlebitis. The deaths were due to valve disease in two instances, and to fatty degeneration of the heart in one instance.

*Diseases of the Absorbent System* were the cause of 164 admissions, all but 10 cases being affections of the inguinal glands. The ratio of admission was 14·1 per 1,000, which has declined from the ratio in the preceding year by 2·2 per 1,000, and is below the rate of the average of six years by 5·5 per 1,000. The greatest prevalence of these affections was in the Presidency, 18·5 per

Bombay.

1,000, and the least, 10·5, in the Poona circle. The latter has declined considerably as compared with the previous year, being less than half. A slight decrease is observed in Quetta, but an increase in other circles.

*Diseases of the Respiratory System* were the cause of 476 admissions and 23 deaths, including one of an invalid, being in the ratios of 40·9 and 1·97 per 1,000 respectively. The ratio of admission is almost identical with that of the preceding year, but that of mortality shows an increase of ·48 per 1,000; while in comparison with the average rates, admission has declined by 8·9, and mortality has increased by ·42 per 1,000. The prevalence of respiratory affections was greatest in the Quetta circle, where the rate was 99·4 per 1,000, and least in the Presidency, 24·9 per 1,000; in the Poona and Mhow divisions the rates were 30·1 and 32·4, and in Sind 50·4 per 1,000. The Quetta ratio is increased by 23·1 as compared with the previous year, and that of Mhow decreased by 12·4; in the others there is not much difference. Mortality was highest in the Quetta circle, 7·41 per 1,000, about twice as much as in 1884; in the Presidency the ratio was 1·51, and in the remainder fractional or *nil*. 362 of the admissions, or over 76 per cent. of the total number, were for bronchial affections, and there were 72 cases of pneumonia, 19 of pleurisy, &c. The deaths were due to pneumonia 20 cases, and to inflammation of the epiglottis, bronchitis, and emphysema, one case respectively.

*Diseases of the Digestive System* caused 2,249 admissions and 59 deaths, including 2 of invalids, being in the ratios of 193·0 and 5·06 per 1,000 respectively. The ratio of admission shows a decline of 20·6 per 1,000, as compared with the corresponding rate in the preceding year; the mortality rate, however, has risen by 2·07. In comparison with average rates also a decrease is observed in the admission rate, equal to 18·2, and an increase in the death rate, equal to 1·73 per 1,000. The greatest prevalence of digestive disorders was in the Quetta district, the ratio being 311·3 per 1,000, which, however, compares very favorably with that in the previous year, and shows a decline of 175·2 per 1,000; the lowest ratio of admission was in the Presidency circle, 145·0, those for Poona, Mhow, and Sind being 184·8, 189·0, and 203·9 per 1,000 respectively; and, with the exception of a decline of 30·6 in the ratio for Sind, there is very little variation in any of them. The mortality ratio was highest in the Quetta district, being 19·76 per 1,000, which is an increase of 9·53 on the preceding year; the next ratio was 4·87 in Sind, and the lowest ·95 in Mhow; the remaining districts being intermediate. The principal diseases causing admission were tonsillitis 214 cases, dyspepsia 476, dysentery 321, diarrhoea 562, and hepatic disease 271, including 16 cases of abscess of the liver. The causes of death were dysentery 34 cases, hepatitis 5, diarrhoea 4, enteritis 4, abscess of liver 3, cirrhosis of liver 3, intestinal obstruction 3, and gastritis, ulceration of the intestines, and peritonitis one case respectively.

In Abstract XXXV. is a table, taken from the report of the Principal Medical Officer, showing the prevalence of dysentery, diarrhoea, and hepatitis in each of the administrative circles; and in Abstract XXXVI. is a table showing the prevalence and mortality of dysentery, diarrhoea, and hepatitis in each quarter of the year. The admission rate for dysentery equalled 28·4 and the death rate 2·89 per 1,000, which are higher than the corresponding ratios in the previous year by 3·1 and 1·96 per 1,000 respectively. The greatest prevalence of, and mortality from, dysentery was in the Quetta circle, the ratios being 70·2 and 19·01 per 1,000, followed by Sind with 33·7 and 3·28 the lowest rate of admission being 18·1 per 1,000 in Poona, and the lowest mortality, ·31, in Mhow. Though Quetta shows the highest admission rate it compares favorably with that in the previous year, but the mortality rate on the contrary is largely increased. The variations in the other circles were not very large. Diarrhoea caused an admission rate of 49·1 and a death rate of ·18 per 1,000, as compared with 46·2 and ·19 per 1,000 in the preceding year. The ratio of prevalence varied from 122·3 per 1,000 in the Quetta district to 21·9 in the Presidency; the ratios in the remaining circles were nearer the latter than the former, the next highest being 58·3 in Sind. The ratio for Quetta shows a decline of 23·7 per 1,000, that for Mhow is almost unchanged, but in the other circles a slight increase is observed. The total admission rate for hepatitis and abscess of the liver was 16·3 per 1,000 and the death rate ·70, the former being above the corresponding ratio in 1884 by 2·1, and the latter lower by ·23 per 1,000. Prevalence of hepatic disease was greatest

Bombay.

in the Poona circle, and least in Quetta, the ratios being 22·8 and 9·1 per 1,000 respectively, the former being rather higher and the latter lower than the corresponding rate in 1884. Quetta gave the highest mortality rate, 2·48 per 1,000; but in Sind and the Presidency it was *nil*. From the next table it will be seen that the greatest prevalence of dysentery was in the third and fourth quarters of the year, the ratios being 9·9 and 9·2 per 1,000 respectively, then in the second and first, the rates being 4·6 and 4·5. Diarrhœa was at its greatest prevalence in the third quarter, 19·6 per 1,000, followed by the fourth, 13·3, and then the second and first with much lower rates. The greatest prevalence of hepatitis and liver abscess is shown by this table to have been in the first quarter of the year, then the third quarter, followed by the fourth, and lastly the second quarter. The difference, however, in the ratios of the quarters is not great, varying only from 4·8 to 3·6 per 1,000.

*Diseases of the Urinary System* caused a ratio of admission of 131·2 per 1,000, of which 119·0 was due to gonorrhœa and its sequelæ. The admission rate for gonorrhœal affections is lower than in the previous year by 29·4, but almost identical with the average rate. The greatest prevalence of gonorrhœa was in the Poona division, the ratio being 155·2 per 1,000, and the least, 43·8 per 1,000, in the Quetta district. Compared with the return for the preceding year the admission rates for gonorrhœal affections have declined in all the administrative circles. 2 deaths are returned as resulting from stricture of the urethra, originally due to gonorrhœa. Other diseases of the urinary system were in the ratio of 12·2 per 1,000, being slightly in excess of the previous year's rate and a little above the average rate. Among the admissions were 18 cases of Bright's disease, one of which proved fatal.

*Diseases of the Generative System*, with an admission ratio of 10·0 per 1,000, differed but very little in frequency either from the record in the previous year or from the average.

*Diseases of the Organs of Locomotion* caused 76 admissions, equal to 6·5 per 1,000, above the average somewhat, but below the last year's rate by 1·9. A death from peritonitis is recorded.

*Diseases of the Cellular Tissue* were about the average in frequency, the admission ratio being 17·7, but this compares favorably with 19·1 per 1,000 in the preceding year.

*Cutaneous Affections* caused 784 admissions, being equal to 67·3 per 1,000 as compared with 78·0 in the preceding year, and with an average rate of 71·1 per 1,000. Cutaneous diseases were by far the most prevalent in the Sind district, the ratio per 1,000 being 125·1, followed by Mhow with 73·4, the Presidency with 68·7, Poona 62·3, and Quetta 37·7 per 1,000. Compared with last year's return, the ratio of prevalence has increased in the Sind division but decreased in all the others.

Under the head of *debility* 403 admissions and 3 deaths are returned, being equal to ratios of 34·6 and ·26 per 1,000, as compared with 36·6 and ·09 per 1,000 in the preceding year. The Sanitaria show a high rate of admission for this cause as usual, 175·8 per 1,000, but in the circles the ratio varies from 48·2 in the Quetta district to 21·6 per 1,000 in that of Mhow.

*Poisons*.—Under this head 115 admissions and 7 deaths are returned, being in the ratios of 9·9 and ·60 per 1,000; the admission rate is above the average by 3·7, and slightly higher than the previous year; the death rate also is above the average, and there was no mortality in 1884. 111 cases were due to the abuse of alcohol, 38 with 3 deaths being returned as delirium tremens, and 73 with 4 deaths as alcoholic poisoning. The remaining 4 admissions comprised 2 for scorpion sting, one for oxalic acid poisoning, and one from eating poisonous fungi.

*Injuries*.—The admission ratio for injuries amounted to 118·9, and the death rate to 1·63 per 1,000, as compared with 113·3 and 2·24 per 1,000 respectively in the preceding year, and with average ratios of 105·5 and 1·60 per 1,000. The admissions for general injuries were 4 in number, two being due to burns and scalds, one to contusion, and one to multiple injury, which proved fatal, at Aden. Three deaths occurred from accidental drowning, and one death by hanging, suicidal. The case occurred at Quetta; it is stated that no ostensible reason could be assigned for the deed, and a verdict of *felo-de-se* was returned; the man, however, was acting as orderly over a dying patient, which may have had



*Bombay.*

a depressing effect on his mind. Local injuries caused 1,382 admissions and 15 deaths; the bulk of the former were contusions, wounds, and sprains, the numbers being 566, 359, and 318 respectively. Among the remaining admissions were 46 for fractures, 16 for dislocation, and 9 for gunshot wounds. The deaths included 8 from gunshot wounds, all of which were suicidal; in two instances no motive for the act could be discovered; in two the act was the result of drink; in one it was due to the same cause combined with domestic trouble; in another to intemperance and misappropriation of money; in another also to misappropriation of money, but it is not stated that the man was intemperate; and with regard to the last case it is said that the man was very temperate and one of the best men in his company, he, however, was of melancholic temperament, and left a statement to the effect that he committed suicide because he was not liked in the regiment. There was also a death by cut throat, suicidal, the man being in a state of melancholia. There were 5 deaths from fracture, four being cases of fracture of the skull, and one fracture of the ribs with injury to the lung, all accidental. There was also one death from rupture of the bladder, which was caused by a fall from a height of 30 feet.

*Surgical Operations.*—These comprised an amputation of the thumb and index finger, on account of gunshot injury; an amputation of the thumb only on account of disease; and amputations of fingers, two cases, one for necrosis and the other for contraction of tendon, all of which had successful results. There was also an operation for removal of fibro-cellular tumour, successful, and an operation for the relief of intestinal stricture with fatal result; also minor operations.

*Invaliding.*—The number of men invalided home during the year was 338, and the number discharged as unfit for further service 140, being in the ratios of 29·01 and 12·02 per 1,000 respectively. Compared with corresponding rates in the preceding year a decrease of 2·51 per 1,000 has taken place in the rate of invaliding home, but an increase of 1·95 in the ratio of final discharge. In comparison with similar average rates for the preceding decennial period a decrease is observed in both ratios, being 19·00 per 1,000 in the former and 4·49 in the latter. The principal causes of invaliding were, febrile affections 15 cases, equal to a ratio of 1·29 per 1,000, which is considerably below the average rate and also below that of the preceding year; rheumatism 12 cases, or 1·03 per 1,000; secondary syphilis 11, or ·94 per 1,000; phthisis pulmonalis 22 cases, or 1·89 per 1,000, which compares favorably with last year's rate, and with the average rate. Nervous affections caused the invaliding of 35 men, equal to a ratio of 3·00 per 1,000, slightly above the average; of these 19, or 1·63 per 1,000, were invalided for mental disease; 34 were invalided for diseases of the circulatory system, or 2·92 per 1,000; 58 for diseases of the digestive system, or 4·98 per 1,000, one half the cases being hepatic affections; the ratio is below the average, but rather above that in the preceding year; 12, or 1·03 per 1,000 for diseases of the organs of locomotion; 78, or 6·69 per 1,000 for debility, and 15 cases of injury, equal to 1·29 per 1,000. The chief disabilities causing final discharge from the service were phthisis pulmonalis 18 cases, equal to 1·54 per 1,000; nervous affections 21, or 1·80 per 1,000; 15 of these, or 1·29 per 1,000, were for mental disease; 26, or 2·23 per 1,000, for circulatory diseases; 15, or 1·29 per 1,000, for debility; and 12, or 1·03 per 1,000, for the effects of injuries.

Abstract XXXVII. gives a table, taken from the report of the Principal Medical Officer, which shows the comparative mortality and invaliding in the three grades of officers, non-commissioned officers, and men for the year under report, and for the ten previous years. It will be observed that in 1885 the highest ratio of mortality, 31·59 per 1,000, was among non-commissioned officers; the lowest, 16·44, among officers, and the intermediate rate of the privates was 22·87 per 1,000. Invaliding, on the other hand, was greatest in proportion among officers, 68·49 per 1,000; next among non-commissioned officers, 43·84 per 1,000, and least among privates, 26·73 per 1,000. Compared with the 10 years' record mortality has increased in all three grades, but invaliding has decreased, and principally among the private soldiers.

In Abstract No. XLVI. is a return furnished by the Principal Medical Officer showing the comparative sickness, mortality, and invaliding of men who

extended their service, and those who had not done so, in the Presidency for the year 1885. From this it will be seen that the proportion of sickness, mortality, and invaliding among those who were completing their extended Indian service is far less than that of the men of shorter service, who were serving under the ordinary conditions.

**Officers.**—The average strength of officers was 365, the attacks of illness numbered 273, the deaths 6, and the number invalided was 25; being in the ratios of 747·9, 16·44, and 68·49 per 1,000 respectively. Compared with corresponding rates in the preceding year there is an increase of 80·3 per 1,000 in the rate of prevalence of sickness, and one of 1·99 per 1,000 in that of mortality, but a decrease of 29·77 per 1,000 in the ratio of invaliding. Scarlet fever caused 1 attack of illness, enteric fever 4, other continued fevers 44, ague 47, remittent fever 4, cholera 5, hepatic affections 10, dysentery 8, diarrhoea 17, &c. The deaths were caused as follows: 1 from enteric fever, 2 from cholera; 1 from peritonitis; and 2 from suicide, in one case by cut-throat and in the other by gunshot, in both instances a verdict of temporary insanity was returned. The causes of invaliding were febrile affections 7 cases, hepatic disease 4, dysentery 3, debility 3, cystitis 2, concussion of the brain 2, and sun-stroke, dyspepsia, diarrhoea, and fibrous tumour one case respectively.

**Women.**—The average strength was 624, and there were 508 admissions into hospital, exclusive of 182 for ordinary childbirth, and there were 8 deaths. The ratio of admission, therefore, was 814·1 per 1,000, and that of death 12·82. Compared with corresponding rates in the preceding year, a slight increase is observed in both, being 19·6 in that of admission, and ·57 per 1,000 in that of mortality. Febrile affections caused the following admissions: Small-pox, one case; measles, 2; enteric fever, 3, two cases fatal; other continued fevers, 23; ague, 75; remittent fever, 6; cholera, 3, one case being fatal; and puerperal fever, one fatal case. Constitutional affections caused 22 admissions only, the majority being cases of anæmia. Among local diseases, nervous affections caused 13 admissions, including one fatal case of sunstroke and two cases of mental disease; disorders of the digestive system caused 66 admissions, 14 of which, with one fatal case, were due to dysentery, 13 to diarrhoea, 18 to dyspepsia, and 5 to hepatic affections; Bright's disease caused one admission, with fatal result; and disorders of the generative system show 56 admissions. Under the head of debility 167 admissions are returned. There was also one death in childbirth.

**Children.**—The average strength of children is returned as 1,236, the number of admissions into hospital 794, and of deaths 66, being in the ratios of 642·4 and 53·40 per 1,000 respectively. The admission ratio is higher than that in the preceding year by 8·8 per 1,000, and the death rate is lower, but only by a small fraction. Among febrile affections were 57 cases of measles, with 4 deaths; 52 of continued fever; 91 of ague; 9 of remittent fever, 2 fatal; 7 of cholera, 6 fatal; and 15 of whooping cough, with one death. Constitutional diseases caused 34 admissions, including 25 of anæmia, one case fatal; 7 of tubercular affections, with 5 deaths; a case of hereditary syphilis, and a fatal case of dropsy. Among local diseases 19 admissions are returned for nervous affections, comprising 14 cases of convulsions, 9 of which proved fatal; 3 of meningitis, with 2 deaths; one fatal case of encephalitis, and one case of sunstroke. Ophthalmic affections, mostly conjunctivitis, caused 115 admissions. Respiratory diseases, principally bronchial affections, were 75 in number, with 4 deaths. Disorders of the digestive system caused 146 admissions, among which were 66 for diarrhoea with 14 deaths, 26 for dysentery with 3 deaths, 5 for enteritis with 4 deaths, 30 for teething, 3 of which were fatal, and one fatal case of peritonitis. Under the head of debility 91 admissions and 3 deaths are returned, and under premature birth 2 deaths are recorded.

**SANITARY CONDITIONS.**—The Principal Medical Officer, in his report, brings to notice the following points bearing on the sanitary condition of the different stations:—

**Presidency District.**—At Deolali a new building has been erected to provide extra accommodation and to serve as a mess-house for married officers and their families. At Aden the ventilation of the military prison has been improved, and the cells are consequently cooler.

*Bombay.*

**Poona Division.**—The health of the troops at Poona during the year did not compare favorably with that in the previous year. The increase of sickness was chiefly due to fevers, and occurred principally among the troops quartered in the Ghorpuri barracks. After some time the sick rate became so high that it was thought right to recommend the evacuation of these barracks, which was accordingly carried into effect, after which a steady although very gradual improvement took place in the health of these troops. The Principal Medical Officer of the division, however, remarks that "with regard to the above, I feel bound to admit that, after careful inspections and close inquiry, I have hitherto been quite unable to discover any condition of so decidedly an insanitary character or any particular cause so marked as to account for the excessive amount of sickness which prevailed in Ghorpuri in May and June."

With reference to Sanitaria, mention is made of the great advantage it is to a young soldier recently arrived from home to pass his first hot season in one of them; and an opinion is recorded that "men only who are suffering from debility consequent on attacks of malarious fever but who are likely to be fit for duty before the end of the hot weather, should be sent to Sanitaria in March each year, and all other cases of sickness should be invalidated, the remaining accommodation at the Sanitaria being filled by men who may be at their duty but whose health has fallen somewhat below par, and by recent arrivals in the country."

The advantages of Khandalla as a health resort are also pointed out, and that it has, owing to its position on the coast of the Bhar Ghaut, a sea breeze during the hot season. It is further stated that persons who suffer from attacks of malarial fever derive special benefit from a change to Khandalla.

**Mhow Circle.**—In Mhow there was a considerable decline in the prevalence of malarial fever, which was attributed to the small rainfall, care in adaptation of clothing, and the draining of an adjacent marsh.

Certain minor sanitary improvements are called for in this station, and these are chiefly the provision at the termination of the surface drains for the proper disposal of the water; properly constructed gutters, with an assured continuity for carrying away the rain from the buildings; better ventilation of certain quarters and barrack rooms; and more accessible latrine accommodation combined with stricter conservancy among the native followers. With advertence to the limited supply of water at Mhow, it is suggested that this might be considerably increased by collecting and storing the roof water. With regard to filters it is remarked that their use is not an unmixed good, as the belief that they remove all impurities "engenders carelessness or apathy in securing the best possible supply of water, and in guarding against contamination from source to delivery."

It is mentioned, with regard to the station of Neemuch, that certain defects exist in the barracks, the chief being the want of jalousies to keep the rain out of the verandahs and surface drains to remove rain water. The guard-rooms, cook-houses, and offices in connexion with the barracks are deficient in this respect. A flagged floor is required for the regimental guard-room, instead of an earthen one. In the hospital there are three requirements mentioned, a ward for insane patients, a prisoner's ward, and a room for the warrant medical officers on duty. The ward used as a hospital for women and children is the lower portion of a barrack, the upper storey of which is occupied by soldiers. As this ward is required for the increased garrison, it is under consideration to remove the hospital for women and children to a more desirable situation. The question of the influence of the Seora tank in producing fevers at Neemuch was exhaustively dealt with by the late Surgeon Major Falwasser, who came to the conclusion that the great prevalence of paroxysmal fevers was not due to this as a cause.

At Nasirabad a number of improvements were effected in the buildings during the year. The water-pipes from roof of barracks have been elongated to force the roof water further away, but down pipes and gutters would effect this in a more satisfactory manner.

At Deesa some overcrowding is reported to have occurred in the artillery barracks, but after a second representation on the subject, steps were taken to remedy the evil.

At Ahmedabad the new station hospital was occupied for the first time.

All things considered, the sanitary conditions of stations in the district were

satisfactory. The subject of efficient drainage and water supply in some stations is still under consideration, but the water is generally of good quality. *Bombay.*

*Sind District.*—The Principal Medical Officer of the district reports that “the general health was fairly good, but there was an increase of malarial fevers. Over the whole province there were a great number of cases of febricula and ague, and it is obvious the cause is not confined to any one place, and probably to no single condition. Inundations and rains are generally accepted as factors in the causation of malarial fevers, but there was no inundation at Karaohi and many other places, and the rainfall was generally scanty. The climatic conditions of the province for the year were much as usual both in Hyderabad and Karachi, with the exception of a high inundation and a scanty rainfall. These, no doubt, are very potent factors in the health of a district, but they are not of universal applicability to the province, and it is clear that there must have been other and unknown conditions which have been powerful in the production of fevers.”

*Quetta District.*—The Principal Medical Officer quotes Brigade Surgeon Bradshaw's report on the Quetta district in full. Among the points referred to by that officer were the following: With regard to climate “the year was remarkable for the inclemency of the weather during the first five months, and for the unusual extent of rainfall, which amounted to 20·9 inches, the average for the preceding 5 years being 8·1 inches. Great daily range of temperature is characteristic of the Quetta climate, and it varied during this year from 21·01 to 42·90. The elevation of the Quetta valley above the sea being so considerable as 5,500 feet, the summer heat, powerful as it is, is far less powerful than in the plains of India, only one case of sunstroke having occurred in 1883; and it diminishes so much at sunset that the nights of the hot season are almost always cool. Hot winds do not prevail, mosquitoes are absent, but house flies and sand flies are troublesome, though not a plague. The Quetta winters are decidedly cold, but snow-falls, though sometimes abundant, seldom lie long in the valley. At times the wind is extremely piercing, and instances are not rare of natives frozen to death.

“The health of the troops was fairly good up to June, when paroxysmal fever became prevalent and cholera began. It had been previously decided to form sanitarium camps in the higher hills for the autumnal sickly season, and the increasing sickness among the troops made it necessary to accelerate their departure from the valley. The change to these much higher elevations proved very satisfactory. Although the men did not escape cholera and fever there, altogether the cases of both were comparatively few; and the cool air was beneficial in maintaining health.”

With regard to the sanitary condition of barracks, &c. it is stated that the barracks occupied by the infantry have been recently erected. They are situated on high ground, are well lighted and ventilated, and kept clean. Of the artillery, the mountain battery have newly built barracks in which the men are satisfactorily lodged, but the auxiliary buildings were not built; the garrison artillery remain in the fort, but barracks are to be raised for them as soon as possible in the immediate vicinity of the former. The military prison is always clean, but proper regimental cells had not yet been provided, nor have special recreation rooms.

A new station hospital was commenced, and on its completion the old hospital huts, which had been repeatedly condemned, were to be abandoned.

The drinking water is obtained from a covered spring, and distributed in the usual way by mussaks, but several plans were under consideration for improving the quality of the water supply; and it is probable that at no distant date a system will be provided which will ensure adequate purity of drinking water.

With regard to drainage, it is reported that “the rainfall drainage of the station of Quetta is provided for by naturally formed channels, and by a broad water way, excavated and embanked, which skirts the east and south of the cantonment, and leads to the river bed which traverses the valley. Ordinary showers are disposed of by surface soil absorption, but really heavy rain quickly runs off to the south and west, the valley slope on which Quetta is situated being steep. The barrack system of sewage is that of

*Bombay.*

“ carting away from latrines, and shallow burial, beyond cantonment limits,  
“ in land which is subsequently placed under cultivation. The natural or dug  
“ out hollows and ditches are to some extent resorted to by followers and way-  
“ fairers, and nuisances are perceptible consequences. Fortunately, and not  
“ rarely, these are vigorously flushed by storm waters. On the immediate  
“ north-east of the valley there is an immense catchment mountain area, the  
“ outlet of which is a narrow pass about 400 feet higher than Quetta.  
“ Through this floods rush and would inundate the station were they not  
“ guided into the main waterways previously mentioned.”

Clothing and bedding were satisfactory and sufficient for the troops, being regulated according to season, locality, and particular duty. One regiment arrived with scanty kits in anticipation of active service, and for a while suffered somewhat in consequence, but this was remedied as soon as possible.

---

## XIII.—ON THE HEALTH OF THE TROOPS SERVING IN EGYPT.

*Sickness and Mortality.*

The following report includes the statistics of sickness and mortality of the troops quartered in Lower Egypt throughout the year, of the Frontier Field Force from 1st August to 26th November, that is after the cessation of hostilities until their recommencement, and of the garrison which occupied Suakin from the 15th May to the end of the year. Egypt.

The statistics of the Nile Expeditionary Force, up to the 31st July 1885, and of the Suakin Expeditionary Force to 14th May 1885, have already been published in the Appendices I. and II. of the last Army Medical Report, and the statistics of the Frontier Field Force from the 27th November, when it again became a force on active service, will be found in a special report in Appendix I. of the present volume.

The average annual strength of warrant officers, non-commissioned officers, and men serving in Egypt was 9,593, the admissions into hospital numbered 14,601, there were 278 deaths, including those of 39 invalids, and 769·71 men were constantly sick. The ratio of admission, therefore, was 1522·0 per 1,000 of strength, that of mortality 28·98, and that of constant inefficiency through sickness 80·23 per 1,000. These ratios are all increased as compared with those of the previous year; the admission rate by 255·8, the death rate by 17·39, and the constantly sick rate by 3·38 per 1,000; and they are also above the corresponding average ratios for the preceding two years. The average sick time to each soldier was 29·28 days and the average duration of each case of sickness 19·24 days, the former being longer by 1·23 days and the latter shorter by 2·91 days than the corresponding period in the previous year.

The following table shows the statistics of sickness and mortality in the different portions of the force as specified above.

—	Average Annual Strength.	Ad-missions.	Deaths in Com-mand.	Constantly Sick.	Annual Ratios per 1,000.		
					Ad-missions.	Deaths	Constantly Sick.
Lower Egypt	8,013	12,017	108	651·90	1499·6	20·72	81·35
Frontier Field Force.	1,115	1,408	32	77·44	1339·0	28·70	69·85
Suakin - -	465	1,091	41	40·37	2346·2	88·17	86·82
Total -	9,593	14,601	239	769·71	1522·0	24·91	80·23

These ratios of sickness and mortality are all very high, particularly those of the troops quartered at Suakin, where sunstroke, heat exhaustion, and enteric fever, were the chief diseases. In the Frontier Field Force, the principal diseases causing admission were fevers, including many cases of enteric fever, and also dysentery, and diarrhoea. In Lower Egypt the prevailing diseases were the same with the addition of venereal affections. The Principal Medical Officer, Surgeon-General J. O'Nial, C.B., states that the sickness was very great and the death rate high, but it must be remembered that most of the men had gone through a most arduous campaign, and those

*Egypt.*

who returned from Suakin took a long time to get over the effects of the climate of that place.

In Abstract XLII. will be found the more important of the health statistics of the regiments and corps which served in the country during the year.

In Lower Egypt the cavalry were represented by one regiment, the 19th Hussars, and a detachment of the 20th Hussars, &c. The ratio of admission for cavalry was 1898·1 per 1,000, and that of mortality 34·85 per 1,000. In the Artillery, among batteries of fair average annual strength, the highest rates of admission and mortality were 2448·6 and 28·03 per 1,000 respectively in No. 5 Battery, 1st Brigade, Scottish Division, and the lowest admission rate was 1291 per 1,000 in No. 2 Battery, 1st Brigade, South Irish Division, the lowest mortality ratio being 13·43 per 1,000 in No. 9 Battery, 1st Brigade, North Irish Division. In the Engineers the ratio of admission was 1364·0 per 1,000 and the death rate reached 36·00 per 1,000, but the average strength was only 250. In the Infantry, the ratios of admission and mortality varied considerably, but taking corps whose average annual strength was over 150, the admission ratio varied from 1960·5 per 1,000 in the 1st Battalion, Gordon Highlanders, to 725·0 per 1,000 in the 3rd Battalion, King's Royal Rifles, and the death rate from 26·31 per 1,000 in the Gordon Highlanders, to 7·32 per 1,000 in the 2nd Battalion, Durham Light Infantry.

In the Frontier Field Force, the 20th Hussars had an annual admission rate of 1946·0, and a death rate of 45·04 per 1,000. In the Artillery, the No. 1 Battery, 1st Brigade, South Irish Division, with an average annual strength of 27, showed an admission rate of 962·9 per 1,000. In the Engineers, the admission rate was 1071·4 and the mortality rate 57·14 per 1,000. In the Infantry, among regiments with fair average annual strength the highest ratios of admission and mortality were 1684·5 and 58·25 per 1,000 respectively in the 1st Battalion Yorkshire Regiment; the lowest admission rate, 945·3 per 1,000, was in the 1st Battalion, Royal West Kent Regiment, and the lowest mortality rate was *nil* in the Staffordshire Regiment.

In Suakin in No. 4 Battery, Southern Division, Royal Artillery, the annual admission and mortality rates equalled 1953·8 and 61·53 per 1,000 respectively; in the 1st Battalion Shropshire Regiment the ratio of admission was 2461·8 per 1,000, and that of mortality 96·15 per 1,000; and in the Staff and Departments the admissions and mortality were in the annual ratios of 2965·5 and 120·7 per 1,000 of strength.

The admissions, mortality, &c. in the different classes and orders of diseases are shown in abstract No. XXXVIII.

**GENERAL DISEASES.**—In the *febrile group* of diseases there were 2,809 admissions, equal to a ratio of 292·8 per 1,000, and 149 deaths, or 15·53 per 1,000, the great majority of the deaths being due to enteric fever. These ratios are much in excess of those in the preceding year.

*Eruptive Fevers* caused 59 admissions and 5 deaths, all in Lower Egypt. The ratios of admission and mortality were 6·1 and ·52 per 1,000, as compared with 4·6 and ·15 in the preceding year. There were 52 cases of small-pox and 4 deaths. Of these 50 cases and 3 deaths occurred in Cairo, the remaining two, one of which was fatal, in Ramleh. The majority of the cases were of a modified form and readily recovered. Most of the admissions occurred in Cairo, and came from the barracks in the town, Kasr-el-Nil, and Abdin. Small-pox was very prevalent among the civil population, among whom vaccination is very imperfectly carried out. Of the remaining admissions for eruptive fevers, 5 were due to measles, among which one case was fatal; there were also two cases of scarlet fever.

*Enteric Fever* caused 497 admissions and 136 deaths, including 8 of invalids, and 47·63 men were constantly sick from this disease. The ratio of admission reached 51·8 per 1,000, that of mortality 14·18, and that of constant inefficiency 4·97 per 1,000. The per-centage of mortality to attack was over 27 per cent.

Of the total number of cases in the Egyptian command, 361 occurred in Lower Egypt, and among them were 87 deaths in the country as compared with 161 admissions and 32 deaths in the preceding year. The admission ratio, 45·0 per 1,000, therefore shows an increase of 20·1 and that of mortality one of 5·91 per 1,000. The per-centage of mortality to attack was 24 as compared with 19·9 per cent. in the preceding year. The Principal Medical Officer remarks that it is probable that many of the cases returned as simple

continued fever and febricula were really mild cases of enteric fever, and this accounts for the death rate of the latter disease being so high. He mentions the frequency with which this disease has been noticed by medical officers to be complicated with dysentery, and states that when troops are moved about a great deal they seem to contract enteric fever more than when they are stationary, and he points out that the troops were constantly being moved during the year. The insanitary condition of the towns is so bad that it is not surprising that men suffer severely from this disease, notwithstanding that every precaution is taken in barracks. 81 of the cases and 16 deaths occurred at Abbassiyeh. It is stated by the medical officer in charge that the cause of this disease is not clear, but 72 per cent. of the total number of cases were from 20 to 24 years of age, and 68 per cent. had under one year's residence in the country. 104 cases and 28 deaths were returned at the Citadel. The medical officer in charge of this hospital is of opinion that the disease is contracted by the men principally in the town and not in barracks; in connexion with this he brings to notice that there was only one admission for enteric fever from the military prison with an average of over 60 prisoners, and this man had only been in prison three weeks. At Alexandria there were 122 cases with 28 deaths; the increase in number was believed to be due to the presence of a large number of men returned from Suakin and the Nile Expedition, and also a considerable proportion of young soldiers new to the country and the vicissitudes of the climate. At Suez there were 48 cases and 14 deaths; of these, 19 with 3 deaths occurred among the garrison of Suez, and the remainder among convalescents or men sent up for change from Suakin. The remaining cases of this disease were 4, one fatal, at Assiout, and 2 at Port Said.

In the Frontier Field Force 70 cases of enteric fever and 21 deaths occurred, being in the annual ratios of admission and mortality of 62·8 and 18·83 per 1,000; the per-centage of deaths to attacks equalled 30 per cent. With regard to the latter the Principal Medical Officer is inclined to think it too high, and that many of the so-called cases of simple continued fever were cases of enteric fever. He states that enteric fever appears to be endemic along the whole Nile valley. At Assuan there were 28 cases and 8 deaths. The type of the disease is said to have been severe as might be expected in a tropical climate, among young soldiers, and after a severe and arduous campaign in the Soudan. The disease was complicated in many cases with pulmonary, splenic, and hepatic congestions, and hæmorrhage. At Korosko there were 16 cases and 6 deaths; these occurred chiefly in the 1st Battalion Yorkshire Regiment soon after they arrived from Assuan, where the disease had been prevalent, prior to the arrival of the regiment the health of Korosko had been remarkably good. At Wady Halfa 24 cases of enteric fever, with six deaths, were returned. The medical officer in charge at this station states that "the disease is probably endemic in the country, but its mode of communication is uncertain. It is apparently more prevalent during the winter than during the summer months, though the proportion of deaths to cases is greater during the hot weather. Most of the cases ran an uncomplicated course, seldom attended by hæmorrhage, and death was generally caused by exhaustion in the second or third week of the disease." There was one case, fatal, at Akasheh, and one case at Kosheh.

At Suakin during the period under report there were 66 admissions for enteric fever and 20 deaths, being equal to annual ratios of admission and mortality of 141·9 and 43·01 per 1,000 respectively. The per-centage of deaths to attacks was 30·3. The Principal Medical Officer remarks in his report that "in May, June, July, and August, there was a relatively large number of admissions for enteric fever. The disease almost ceased in September and October, and showed a remarkable increase in November and December. This increase was attributed to the arrival from England on the 3rd November of a draft of young soldiers for the Shropshire Regiment. The medical history of this draft well illustrates the great susceptibility of young and unacclimatised men to this and other tropical diseases. It is worthy of remark that no cases of enteric fever occurred among the native (Indian) troops, though they were for the most part placed in positions much more insalubrious than those occupied by British troops. There is no evidence connecting the occurrence of enteric fever with contamination of the water supply or food. The water supply appears to have been particularly free from suspicion."

*Egypt.*



*Egypt.*

*Other Continued Fevers* caused 1,942 admissions and 2 deaths, equal to ratios of 202·5, and ·21 per 1,000. 1,471 of the admissions, equal to 183·3 per 1,000 of the strength, occurred among the troops in Lower Egypt, the admission rate shows an increase of 58·5 per 1,000 as compared with the corresponding rate in the preceding year; 932 of these cases were febricula, the remainder simple continued fever, and 2 deaths are returned under the last-named disease. In the Frontier Field Force there were in the period under report 347 admissions for these fevers, equal to an annual admission rate of 311·2 per 1,000; and in the garrison of Suakin there were 124 admissions, being in the annual ratio of 266·6 per 1,000.

*Paroxysmal Fevers* show 283 admissions and 8 deaths. Of these 258 admissions occurred in Lower Egypt; 31 cases with 2 deaths being due to remittent fever, and the remainder to ague. The admission ratio for these fevers was 32·2 per 1,000 compared with 20·6 in the preceding year. The Principal Medical Officer states that a detachment of the 2nd Battalion Sussex Regiment, stationed at Suez, suffered severely from ague and remittent fever, both while it remained in that place and after it had been transferred to Cairo. It appears that the camp at Suez is very low-lying, water being obtainable only two feet from the surface, and the whole of the land in the vicinity is wet on account of irrigation and percolation from the fresh-water canal which passes close by. The inhabitants of Suez suffer from these fevers every autumn. There is practically no malarious disease in the other stations in Lower Egypt.

In the Frontier Field Force there were but 2 admissions for ague, but in Suakin, in the period under report, there were 4 admissions for ague and 19 for remittent fever, with 1 death from the latter disease. The annual admission rate for these fevers was, therefore, 49·4 per 1,000. The Principal Medical Officer, Suakin, states that "attacks of malarial fever, chiefly of a remittent type were of frequent occurrence during November and December among the British troops. There can be no doubt that the station is, as might be expected from the condition of the soil and drainage, distinctly malarious."

*Other febrile diseases* caused 28 admissions and 2 deaths. Of these 26 cases and both deaths occurred in Lower Egypt. Among these were 21 cases of erysipelas, two of diphtheria, one of which died, and one fatal case of pyæmia.

*Diseases of the Constitutional Group.*—The admissions for *rheumatism* numbered 383, chiefly occurring in Lower Egypt, where the ratio of admission equalled 42·4 per 1,000, which is in excess of the corresponding rate in the preceding year. Nearly one third of the cases are recorded as being of the acute form. There was, however, no death.

The ratio of admission for *primary syphilis* in the whole command was 177·4 per 1,000, and for *secondary syphilis* 34·5 per 1,000. In Lower Egypt the admissions for primary syphilis were 1,613 in number, and for secondary syphilis 306, being in the ratios of 201·2 and 38·18 per 1,000 respectively; the former being lower by 28·2 and the latter higher by 1·1 per 1,000 as compared with the corresponding ratios in the preceding year. Including gonorrhœa and its sequelæ, the total admission rate for all forms of venereal disease was 369·8 per 1,000, and the ratio of constant inefficiency on account of these diseases was equal to 23·35 men per 1,000 of strength. Though these ratios mark a great prevalence of venereal disease they both show a slight decline as compared with corresponding ratios in the preceding year, the former by 15·6 and the latter by 3·00 per 1,000.

In the Frontier Field Force there were but few admissions for syphilis, the primary form causing an annual admission ratio of 33·2 and the secondary form one of 18·8 per 1,000; in the Suakin force the annual ratios were equal to 111·8 and 8·6 per 1,000 respectively. The death of one invalid from the effects of secondary syphilis is recorded.

*Tubercular diseases* caused 74 admissions in all and 13 deaths, including 8 of invalids; the ratios being 7·7 and 1·36 per 1,000 respectively. Nearly all the cases occurred in Lower Egypt, and the ratio of admission, 8·8 per 1,000, is higher than in the preceding year by 1·8. The deaths were all due to phthisis pulmonalis.

Among other constitutional diseases one case of scurvy, one of diabetes, and 17 of anæmia are recorded.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused a total of 540 *Egypt*. admissions and 25 deaths, including that of an invalid, being in the ratios of 56·3 and 2·61 per 1,000. In Lower Egypt only the admissions were 226 in number, and the deaths 7, equal to 28·2 and ·87 per 1,000 respectively, as compared with 21·1 and ·46 per 1,000 in the previous year. Among the admissions were 45 for sunstroke, 25 of which occurred at Suez, where also 26 cases of nervous exhaustion from heat were admitted, chiefly in men from Suakin. Two deaths from sunstroke occurred at Abbassiye. Epilepsy caused 27 admissions, neuralgia 66, and some form of paralysis 11; there were also 40 admissions for mental affections, equal to 5·0 per 1,000 of strength. The following deaths are also recorded, 2 from meningitis and 1 from apoplexy, dropsy of the pia mater, and abscess of the brain respectively.

In the Frontier Field Force there were only 34 admissions in the period and 2 deaths, being in the annual ratios of 30·4, and 1·7 per 1,000 respectively. Eighteen of the admissions were due to sunstroke, which also caused both the deaths. Of the remaining cases 4 were paralysis and 5 mental affection. In the Suakin garrison no less than 280 admissions out of an average annual strength of only 465 are recorded, equal to the high annual ratio of 602·2 per 1,000. With the exception of 2 cases of epilepsy and 2 of neuralgia, all the admissions resulted from the effects of great heat; 60 cases of sunstroke, with 15 deaths, and 216 cases of heat exhaustion are recorded. The Principal Medical Officer remarks that the insufficient protection from the intense heat of the sun during the hotter months, afforded by tents, was, probably, to a considerable extent, accountable for this; but he thinks that the excessively high temperature in conjunction with the moisture and stillness of the air would probably, however, with the best possible accommodation, be largely productive of these conditions.

*Diseases of the Eye* caused 699 admissions in all, equal to 72·9 per 1,000. In Lower Egypt only there were 510 admissions, being in the ratio of 63·6 per 1,000, an increase of 11·0 on the corresponding rate in the preceding year. Of the cases, 476 were conjunctivitis, nearly all mild in character. In Upper Egypt there were 184 admissions, equal to an annual ratio of 165·0 per 1,000. With the exception of 3 cases of hemeralopia and one of nyctalopia all were conjunctivitis, and all of a mild nature.

*Diseases of the Ear* caused a ratio of admission of 19·6 per 1,000, dependent on 188 admissions; of these, 165 cases occurred in Lower Egypt, equal to a ratio of 20·5 per 1,000, a considerable increase on that in the previous year. The great majority of the admissions were cases of inflammation of the external meatus, which is very common, as in all hot climates.

*Diseases of the Circulatory System* caused 166 admissions and 2 deaths, also one of an invalid, being in the ratios of 17·2 and ·31 per 1,000. In Lower Egypt there were 140 cases, or 17·4 per 1,000. Of the cases treated 84 were due to palpitation and 37 to valve disease of the heart. The deaths were due to endocarditis and aneurism, one case respectively. In the Frontier Force there were only 16 admissions, 8 being for palpitation and 6 for organic heart disease; and in Suakin there were 8 cases of palpitation and one of valve disease.

*Diseases of the Absorbent System* caused 157 admissions, of which 150, equal to 18·7 per 1,000, occurred in Lower Egypt. The ratio is slightly increased as compared with the preceding year. Under the head of diseases of ductless glands, the death of an invalid from Addison's disease is returned.

*Diseases of the Respiratory System.*—396 admissions and 15 deaths (including one of an invalid from pneumonia) are recorded, being in the respective ratios of 41·3 and 1·56 per 1,000. The admissions in Lower Egypt alone were 344 in number, the ratio per 1,000 being 42·9, as compared with 35·3 in the previous year. 237 of the cases were bronchial affections, 83 pneumonia, and 19 pleurisy. There were 13 deaths from pneumonia, and one from bronchitis. In the Frontier Field Force there were 41 admissions, including 25 of bronchial attacks, 10 of pneumonia, and 3 of pleurisy, but no death occurred. The annual ratio of prevalence equalled 36·8 per 1,000. In Suakin the annual ratio of admission was 23·6 per 1,000, based on 11 admissions, 9 for bronchial affections and one each of pneumonia and pleurisy.

*Egypt.*

*Diseases of the Digestive System* caused 2,871 admissions in the whole command, equal to a ratio of 299.3 per 1,000. There were 32 deaths in the country and 9 of invalids, the mortality ratio being 4.27 per 1,000.

The admissions in the force in Lower Egypt were 2,225, and the deaths 23; the ratios of admission and mortality were, therefore, 276.4 and 2.87 per 1,000 respectively, both of which are a good deal increased as compared with the corresponding ratios in 1884, the former by 76.7 and the latter by 1.84 per 1,000. The principal causes of admission were, tonsillitis 233 cases, dyspepsia 353, diarrhoea 550, dysentery 416, and hepatic affections 354; of the latter 221 cases were jaundice, 102 hepatitis, 26 simple enlargement, and 5 abscess of the liver. Of the deaths in the country, 15 were due to dysentery, 3 to liver abscess, 2 to hepatitis, and one to atrophy of the liver and splenitis respectively. Of the deaths of invalids, 7 were caused by dysentery and 2 by hepatitis.

In the Frontier Field Force the admissions for digestive disorders were 391 in number, equal to an annual admission rate of 350.7 per 1,000, and the deaths 6, or 5.38 per 1,000 annually. Diarrhoea and dysentery were the chief diseases, the admissions being 193 and 97 respectively, and there were 5 deaths from dysentery. Hepatic affections, including 13 cases of jaundice, numbered 31, and there was one death from abscess of the liver.

The Suakin garrison shows a very high annual ratio of admission for diseases of the digestive system, 548.4 per 1,000; the admissions numbered 255; the chief causes were diarrhoea and dysentery, 101 and 98 cases respectively. They prevailed chiefly in the cooler months, and as in the case of enteric fever there were no grounds for connecting them with the water. The diurnal variation of temperature was never very great, and the temperature of the nights hardly ever sank sufficiently to produce chill; doubtless, however, some of the attacks may have been excited by individual imprudence, resulting in chilling of the abdomen, though the men were strongly impressed with the necessity of wearing their flannel belts during the evening and night. It was noticed also that newcomers showed special liability to attacks of these affections. Hepatic diseases caused 22 admissions, 18 being cases of jaundice.

*Diseases of the Urinary System.*—Gonorrhoea and its sequelæ caused a total admission ratio of 113.3 per 1,000. Taking Lower Egypt separately, the admission ratio for gonorrhoea and its sequelæ was 130.5 per 1,000, as compared with 118.9 in the preceding year. As would be expected, the annual admission ratios in the Frontier Force and at Suakin were low, being only 24.2 and 30.1 per 1,000 respectively. Other diseases of the urinary system caused 83 admissions, or 10.3 per 1,000, among the troops in Lower Egypt. Among the cases were 4 of nephritis and 21 of urethral stricture. In the Frontier Force there were only 8 admissions, and in Suakin 5. One invalid died after arrival at home from abscess of the kidney.

*Diseases of the Generative System and of the Organs of Locomotion* gave admission ratios of 10.2 and 7.3 respectively among the troops in Lower Egypt. The former has declined slightly, but the latter is identical with that of the preceding year.

*Diseases of the Cellular Tissue* caused an admission ratio of 31.2 per 1,000 in Lower Egypt, which is higher than in the preceding year by 5.9. In the Frontier Force prevalence was equal to 43.9 per 1,000 and in Suakin to 58.0 per 1,000.

*Cutaneous diseases* gave a total ratio of prevalence of 83.1 per 1,000. In Lower Egypt there were 679 admissions, or 84.7 per 1,000, being greater than the ratio in the preceding year by 8.8 per 1,000. The most prevalent affections were ulcers, boils, and eczema; other causes of admission were numerous, but none especially common. The annual ratios of cutaneous affections among the troops on the Frontier and Suakin were 73.5 and 77.4 per 1,000 respectively.

*Debility* caused a total ratio of admission of 86.3 per 1,000, and 5 deaths were recorded under this head, 4 being among invalids. In Lower Egypt the admission ratio was equal to 80.8 per 1,000, as compared with 48.5 in the previous year. In the Suakin Force the annual ratio for debility was, as would be expected from the enervating nature of the climate, very high. In the Frontier Force the annual ratio was not excessive.

Under the head of *poisons*, 37 admissions and 4 deaths occurred in Lower Egypt, being in the ratios of 4.6 and .49 per 1,000, considerably higher than

in the preceding year. 35 of the cases were due to the abuse of alcohol, 27 with two deaths being returned as alcoholic poisoning, and 8, with one death as delirium tremens. One fatal case of accidental poisoning by chloroform vapour occurred during its administration for the performance of an operation, and there was one case of poisoning from decayed meat. One case of alcoholic poisoning occurred at Assuan and one of snake bite at Kosheh. There was also one case of alcoholic poisoning at Suakin.

*Injuries.*—The rate of prevalence of injuries of all forms in Lower Egypt amounted to 103·2 per 1,000 as compared with 96·4 in the preceding year. There were 12 deaths. Multiple injury caused 2 admissions and 3 deaths; two at Ramleh and one at Suez. Local injuries caused 817 admissions; wounds, contusions, and sprains being most frequent. 39 admissions for fractures are returned, and six deaths. Five of the latter were cases of fracture of the skull, resulting from accidental falls; the other case, a severe fracture of the femur by a fall from a train, amputation was performed, but with fatal result. Two deaths resulted from gunshot wound, one from the accidental discharge of a rifle, but the other was suicidal. No motive was discovered for the act. There was also a death by suicide by cut-throat; the man was a prisoner at the time; a verdict of temporary insanity was returned. 8 admissions for injuries in action occurred at Suez, and were in men who had come from Suakin. In the Frontier Field Force there were 62 admissions for local injuries, 25 being for wounds, 16 sprains, and 15 contusions, &c. Two deaths from drowning, both accidental, occurred in the Nile at Assuan, and at the same place there was also a death from gunshot wound of the head, suicidal; no motives could be discovered for the act. 21 admissions for local injuries occurred at Suakin; there was no death, and the cases were not of great moment. Three deaths of invalids are recorded. Two occurred on board ship from the effects of gunshot wounds received in action, and one, after arrival at home, was a case of cut-throat, suicidal, in a state of mental depression.

In addition to that alluded to above, there was, among other operations, an amputation at the ankle joint on account of caries, with successful result; also a case of tapping and drainage of hepatic abscess, with fatal result.

*Invaliding.*—The total number of men invalided home from Egypt during the year was 1,462, equal to 152·40 per 1,000, which is a much higher ratio than in the previous year. This increase was due to the effects of the Suakin and Nile campaigns. The principal causes of invaliding were as follows:—Enteric fever 174 cases, equal to a ratio of 18·14 per 1,000; other fevers 170 cases, or 17·73 per 1,000; secondary syphilis 45, or 4·69 per 1,000, and tubercular diseases 53, or 5·53 per 1,000. Among local diseases there were 138 men invalided for diseases of the nervous system, equal to a ratio of 14·39 per 1,000; 34, or 3·64 per 1,000, being cases of mental disease; also 260 were invalided for affections of the digestive system, equal to 27·10 per 1,000; of these, 144, or 15·01 per 1,000, were cases of dysentery, and 23, or 2·40 per 1,000, affections of the liver. Debility is returned as the cause of invaliding of 350 men, equal to a ratio of 36·49 per 1,000.

The number of men finally discharged the service by invaliding was 473, or 49·30 per 1,000. The principal disabilities necessitating discharge were tubercular diseases, 57 cases, or 5·94 per 1,000; nervous affections, 47 cases, or 4·90 per 1,000, 28 being cases of mental disease, aural affections, 26 cases, or 2·71 per 1,000; diseases of the circulatory system, 92 cases (including 43 of valve disease of the heart), or 9·59 per 1,000; diseases of the digestive system, 20 cases, or 2·08 per 1,000; debility, 66 cases, or 6·88 per 1,000, and injuries, 72 cases, or 7·51 per 1,000; of these 49 or 5·11 per 1,000 were the result of injuries received in action.

*Officers.*—The average strength of officers in Egypt was 344, the number of attacks of illness recorded 425, there were 9 deaths, and 82 officers were invalided. The rate of prevalence of sick, therefore, was 1235·4 per 1,000, that of mortality 26·16, and that of invaliding 238·37 per 1,000, the latter being greatly increased by the effects of the Suakin and Nile campaigns. In Lower Egypt the average strength was 276, the attacks of illness 325, the deaths 5, and 63 were invalided, including those from the effects of illness in Upper Egypt. The ratios per 1,000 from these figures were 1177·5, 18·11, and 198·74. Compared with the preceding year mortality was lower, but

*Egypt.*

sickness and invaliding higher. Among the cases of illness were 3 of small-pox, 1 of measles, and 10 of enteric fever, also 88 cases of other febrile affections; dysentery caused 22 attacks of illness and 1 death, diarrhœa 42 attacks, and hepatic affections 21. The deaths were due to enteric fever in two cases, and to meningitis, bronchitis, and dysentery, in one case respectively. The causes of invaliding were febrile affections 22 cases, including 11 of enteric fever, debility 13 cases, dysentery 9, diarrhœa 4, hepatic disease 5, effects of injuries 3, secondary syphilis 2, and anæmia, bronchitis, fistula, and cystitis, one case respectively. The average annual strength of officers in the Frontier Field Force was 41 and the admissions 55, which gives a high annual admission rate, 1341·5 per 1,000. The causes of admission were principally fevers and bowel complaints, there being 26 cases of the former (including 2 of enteric fever) and 14 of the latter. There was one death from enteric fever. The sick-rate among officers at Suakin was also very high, 1666·6 per 1,000, 45 cases of sickness having occurred in the period under report in an average annual strength of 27 officers. Among the admissions were 3 cases of enteric fever, 12 of other fevers, 6 of bowel affections, 3 of nervous exhaustion, and 11 of debility. There were 3 deaths, 2 from enteric fever and one from sun-stroke; 19 officers were invalided, the causes being principally fevers and debility.

*Women and Children.*—The average strength of women in Lower Egypt was 44, and of children 65, and the admissions to hospital 21, or 477·2 per 1,000, and 28, or 430·7 per 1,000, respectively. Fevers and debility were the principal causes of admission among women, and fevers and bowel affections among children. Enteric fever caused the admission of two women, one case fatal, and of three children, two cases fatal. Three children were attacked with diphtheria with fatal result, and three children died from diarrhœa and one child from debility.

*Sanitary conditions.*—The reports of medical officers in charge of station hospitals, &c. in Lower Egypt show that the sanitary condition of the barracks and hospitals themselves is, generally speaking, good, but that the sanitation of the towns in Egypt and the country generally, is bad. Care is taken to keep the sanitary condition of quarters in as satisfactory a state as possible. Various improvements in the different barracks and hospitals were carried out, and among others, the Principal Medical Officer mentions that a new system of drainage was constructed at the Citadel, for waste water; the kitchen at the Citadel hospital, which was in an open verandah, has been roofed in, and some hot plates added in order to keep the diets hot until they are served up. The barracks at Ramleh were vacated, temporarily, in April and May, a large number of cases of enteric fever having occurred in them; sanitary improvements were made, and since then they have been favorably reported on. At Suez it was necessary to have the barracks vacated on account of the large number of cases of ague which occurred there; a small hospital was, however, still retained at this place. In Alexandria improvements were made in the ventilation of the Ravelin barracks, and alterations were in progress in other barracks. Several improvements were also in course of being carried out at the military prison.

With regard to the stations in Upper Egypt occupied by the troops during the period under report, the principal were Wady Halfa, Korosko, and Assuan. In the first-named the troops were for the most part quartered in huts built of sun-burnt brick, thatched with grass and palm leaves, but some were accommodated in old permanent buildings, originally intended for purposes connected with the railway, and some in a brick barrack built for a sugar factory. Others lived during the whole period in European privates' tents, Indian pattern, in sheds of mats or timber. The huts were ventilated by opposite windows and by openings near the roof, and it is reported that the air was found to be at all times pure and sweet. The water supply was from the river, the water being drawn as much as possible from the centre of the stream. Water at low Nile is said to be pleasant and tolerably clear, but between June and November it is turbid and full of suspended matter. The rations were, generally speaking, favorably reported on, but vegetables were only to be obtained in small quantities in the district; for the greater part of the period, however, a daily issue of fresh potatoes was supplied, and when the full ration fell short it was supplemented by onions and occasionally by rice. The Senior Medical Officer

remarks that the climate during the summer months is extremely hot during the day, but the diurnal variation is very great, and at all seasons of the year the nights are moderately cool. Owing to the almost entire absence of rain the air is remarkably dry, so that the high temperatures are not so much felt as they would be otherwise. In the winter months the climate is cool and bracing.

At Korosko it is stated that the general sanitary condition both of the station and its vicinity was excellent. The troops were all lodged in huts composed of mud bricks roofed with matting and mud. They accommodated 24 men each, and were well ventilated. The hospital also consisted of huts similar in construction to those above mentioned. Water supply from the river was improved in quality by treating it with alum and by filtration. The rations were generally satisfactory, though it is said that the supply of fresh meat once failed for a few weeks.

At Assuan the troops were located some above the town on Tagoog heights, about 250 feet above river, and some below, under palm trees along the banks of the river. They lived chiefly in huts, well ventilated, and similar in construction to those mentioned above at other stations. The hospital is also on Tagoog heights, which is a fine airy situation. The place below the town where the troops were located is very little above Nile level at its highest, and is not nearly so healthy, so open, or so exposed to the influences of the prevailing winds. The remarks regarding the rations and cooking, as well as regards water supply and the means of purification, are of the same nature as those previously made with reference to these points elsewhere.

With regard to Suakin, the sanitary officer states in his report that "the ground in the neighbourhood of the town is extremely polluted. Owing to the very slight elevation of the land, only a few feet above the sea level, there is no outfall for drainage, and the long neglect of sanitary precautions by the natives has led to the soil becoming saturated with filth of various kinds. The water in the harbour rises and falls at irregular intervals, the variation in its level being apparently dependent on the direction of the wind. The low-lying land to the west is thus frequently inundated, and on the subsidence of the sea presents an extensive surface of organic decomposition. Under the same circumstances the sloping coral reefs to the south alternately covered and exposed to the sun emit offensive organic effluvia." These conditions, added to the effects of the intense heat, from which tents with mat shelters were obviously inadequate protection, were sufficient to produce the high rate of sickness which existed among the troops. The water supply was derived from condensation of sea water, and was generally satisfactory, and the food, clothing, bedding, and cooking arrangements for the European troops left little to be desired on these points.

Troops on  
Board Ship.

#### XIV.—ON THE HEALTH OF THE TROOPS ON BOARD SHIP.

The troops embarked during the year, as shown in the returns received at head-quarters, were :—

I. Troops proceeding on service abroad	-	-	-	31,086
II. Troops returning from abroad	-	-	-	18,386
III. Troops proceeding from one station abroad to another	-	-	-	16,660
IV. Invalids returning to England	-	-	-	4,513

##### I.—TROOPS PROCEEDING ON FOREIGN SERVICE.

The total number of warrant officers, non-commissioned officers, and men embarked for foreign service during the year was 31,086, the equivalent annual strength being 1,745. The admissions into hospital were 1,809 in number, and there were 7 deaths, giving the annual ratios of 1,036·6 and 4·01 per 1,000 respectively.

Compared with the corresponding rates for the previous year, an increase of 39·3 per 1,000 is observed in the ratio of admission, and one of 2·00 per 1,000 in that of mortality, and compared with similar average rates for the preceding 10 years an increase of 303·2 per 1,000 has occurred in the admission rate, and one of ·04 per 1,000 in the rate of mortality.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract XXXIX.

**GENERAL DISEASES.**—The admissions in the *febrile group* numbered 63, equal to a ratio of 36·1 per 1,000, greater than that in the year preceding by 8·0. No cases of *eruptive fever* occurred, but 9 cases of *enteric fever*, one of them fatal, are recorded, of which 5 happened on board the s.s. "Richmond Hill" during a prolonged voyage to the Cape. The first of these cases occurred on the 56th day of the voyage, and the 30th after touching at Madeira. The medical officer in charge believed that these cases were due to decomposing matter in the bilge, which had not been properly cleaned before starting. The drinking water, obtained from England and Madeira, and stored in tanks, was found also to be impure, but whether the impurity was due to the tanks not having been properly cleaned, or was in the water itself when shipped, could not be determined. Of the remaining cases two occurred on board the "Malabar" on a voyage to Bombay, and one on board the "Serapis" on a similar voyage; it is stated that all these were contracted before embarkation. One of the cases on board the "Malabar" had a fatal result. The remaining case happened on board the "Deccan" on a voyage to Alexandria, but no particulars are recorded. *Other continued fevers* caused 38 admissions, chiefly cases of *febricula*, the admission ratio, 21·8 per 1,000, shows an increase on the rate in the preceding year. *Paroxysmal fevers* were represented by 11 cases of *ague*, 7 of which occurred on one vessel, it is said, in men who had previously suffered in India. The *other diseases* of this group were 3 of *erysipelas* and 2 of *mumps*.

589 admissions are returned under the head of *constitutional diseases*, being in the ratios of 337·5 per 1,000 of average annual strength as compared with 309·7 per 1,000 in the preceding year. *Rheumatism* caused 34 admissions, 19 of these were of the acute form, of which one proved fatal. The admissions for *primary syphilis* numbered 496, and for *secondary syphilis* 54, being in the ratios of 284·2 and 30·9 per 1,000 respectively, which are higher than the corresponding ratios in the preceding year, the former by 28·7 per 1,000, and the latter by 6·8 per 1,000. The admission rate for all forms of venereal disease was 536·9 per 1,000 as compared with 517·7 per 1,000 in the foregoing year. Five admissions are recorded for *tubercular diseases*, four being cases of *phthisis pulmonalis*.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused 14 admissions; of these 5 were due to some form of neuralgia, 3 to sunstroke, 1 case being fatal, 2 to mental disease, 2 to epilepsy, and 1 to paralysis and convulsions respectively. There was also one death from apoplexy.

*Ophthalmic affections* caused 14 admissions, mostly cases of conjunctivitis. *Diseases of the circulatory system* show only 3 cases of palpitation. *Respiratory affections* numbered 85 cases, equal to a ratio of 48·7 per 1,000; of the cases 45 were due to pneumonia, two of which were fatal, 3 to pleurisy, one to asthma, one to hæmoptysis, and the remainder to bronchial affections. *Disorders of the digestive system* were the cause of 129 admissions, being at the rate of 73·9 per 1,000, as compared with 87·0 per 1,000 in the previous year. 67 of the admissions were due to tonsillitis, 13 to dyspepsia, 14 to diarrhoea, and 11 to hepatic affections. Under *diseases of the urinary system* gonorrhoea and its sequelæ show 387 admissions, being at the rate of 221·8 per 1,000 of average annual strength, which shows a decline of 16·3 from the corresponding rate in 1884. *Diseases of the cutaneous system* gave 239 admissions, the ratio, 137·0 per 1,000, showing a slight increase. Considerably more than half the admissions were due to itch, boils and ulcers being next in prevalence. The remaining orders of local diseases do not show any marked increase in prevalence, nor do any of the cases call for special mention.

*Debility* caused 40 admissions, or 22·9 per 1,000; and under the head of *poisons* there were two cases of delirium tremens, both of which recovered.

There were 6 instances of general injury, 5 being due to burns or scalds, and one to multiple injury, which was fatal, and was due to an accident while weighing anchor, the right leg being wrenched off below the knee, the left femur fractured, and also the skull. Local injuries were the cause of 122 admissions, equal to 69·9 per 1,000, being an increase of 9·7 on the rate in the previous year. The chief admissions were for wounds, contusions, and sprains, with a few only for fractures and dislocations.

The *sanitary condition* of the vessels has been reported as satisfactory, with one or two exceptions, as in the case above mentioned, and one where the ventilation of the lower troop deck might be improved, and in another where the ventilation was said to be insufficient.

## II.—TROOPS RETURNING HOME FROM ABROAD.

The number of effective warrant officers, non-commissioned officers, and men who embarked for England from abroad was 18,386, the equivalent annual strength being 1,067. The number of admissions to hospital was 924, and of deaths 10, being in the annual ratios of 865·9 and 9·37 per 1,000 of average annual strength respectively. Compared with the preceding year, the admission rate shows an increase of 60·8 and the mortality rate a decrease of 5·51 per 1,000; and in comparison with the average of corresponding rates for the preceding 10 years, an increase of 172·7 per 1,000 has occurred in that of admission and a decrease of 2·73 per 1,000 in that of mortality.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract XXXIX.

**GENERAL DISEASES.**—Under the head of the *febrile group* of diseases are returned 194 admissions and 4 deaths, equal to ratios of 181·8 and 3·75 per 1,000 respectively. Compared with corresponding rates in the previous year the former shows an increase of 58·7, but the latter a decline of 4·37 per 1,000. One case of small-pox occurred on board a transport proceeding from Alexandria to England, but no other case of *eruptive fever* is recorded. *Enteric fever* caused 31 admissions and 3 deaths, as compared with 2 admissions and no death in the preceding year. All the cases were on board vessels bringing home troops who had served either in Egypt or Suakin. 22 cases and one death occurred on board the transport “Erin,” and one case on the “Lydian Monarch,” both from Suakin; 2 cases, one fatal, happened on the s.s. “Australia,” one on the “Persian Monarch,” and one on the “Tamar,” all from Alexandria; and 4 cases and one death occurred on the s.s. “Poonah,” among the Scots Guards, on passage home from Cyprus. All these cases of enteric fever may fairly be attributed to service in Egypt. Other continued fevers caused 85 admissions, 22 occurring on the s.s. “Erin,” from Suakin;

*Troops on Board Ship.*



*Troops on Board Ship.*

25 on board the "Orontes," bringing home two battalions of Guards from Cyprus; and 13 on the "Stirling Castle," from Alexandria. A death from simple continued fever is reported.

*Paroxysmal Fevers* caused 77 admissions, or 72·2 per 1,000 of average annual strength, which has declined by 17·1 from the rate in the previous year; 64 of the cases were due to ague, the remainder to remittent fever. Most of the cases of ague occurred on the Indian troopships; and of the cases of remittent fever 6 occurred on ships from China, 3 on vessels from the Mediterranean, 2 among men from Egypt, and 2 on Indian troopships.

The *constitutional group* of diseases caused 199 admissions but no deaths; the ratio of admission, 186·5 per 1,000, is less than in the previous year by 8·4. *Rheumatism* was the cause of 16 admissions, 4 being cases of rheumatic fever. *Primary syphilis* caused 154 admissions and secondary syphilis 21, the ratios being 144·3 and 19·7 per 1,000 respectively, which differ very little from the corresponding ratios in the preceding year.

The total admission rate for all forms of venereal disease, including gonorrhœa and its sequelæ, amounted to 288·7 per 1,000, slightly higher than in the preceding year. Six admissions are recorded for *tubercular diseases*, all of them being cases of phthisis pulmonalis. Two cases of anæmia are also returned.

**LOCAL DISEASES.**—*Diseases of the nervous system* caused 7 admissions, 4 for neuralgia, one for paralysis, one for epilepsy, and one, which proved fatal, for apoplexy. Of 12 admissions for *ophthalmic affections*, 9 were caused by conjunctivitis.

*Diseases of the Circulatory System* caused only 5 admissions. *Respiratory diseases* show 38 admissions. Among them were 7 cases of pneumonia, one of pleurisy, and one of asthma; the remainder were bronchial affections. *Digestive diseases* caused 154 admissions and 3 deaths, being in the respective annual ratios of 144·3 and 2·81 per 1,000, being above the corresponding rates in the preceding year. The principal causes of admission were dysentery, diarrhœa, and hepatic affections. The deaths were due to hæmatemesis, dysentery, and abscess of the liver, one case respectively. Out of 136 admissions recorded under *diseases of the urinary system* 133 were due to gonorrhœa or its sequelæ, the ratio of admission for these affections being 124·7 per 1,000, which, however, differs only by 3·0 per 1,000 from that, the previous year. *Cutaneous diseases* caused 49 admissions, more than half of which were caused by ulcers.

*Debility* shows 32 admissions, and *poisons* 5, all due to the abuse of alcohol. One death from delirium tremens is recorded.

Three *injuries* of a general character are returned, all burns and scalds. Local injuries caused 35 admissions, chiefly for wounds and contusions. One man returning from Bombay committed suicide by cutting his throat with a razor. It is said he had been drinking hard prior to embarkation. The court of inquiry came to the conclusion that he was suffering from temporary insanity.

The *sanitary condition* of the vessels was reported generally to be very good. In one or two instances it is said that ventilation of lower decks was difficult in the tropics, and there was slight over-crowding mentioned in the report of one voyage.

### III.—TROOPS PROCEEDING FROM ONE STATION ABROAD TO ANOTHER.

The number of warrant officers, non-commissioned officers, and men who proceeded from one station abroad to another was 16,560, which gives an equivalent annual average strength of 594. The admissions into hospital numbered 583 and the deaths 10; the annual rate of admission was, therefore, 981·5 and of death 16·84 per 1,000. Compared with the corresponding rates in the preceding year there is an increase of 308·6 per 1,000 in admission rate and the mortality rate is nearly doubled. In comparison with the average similar rates for the preceding decennial period an increase is observed in the rate of prevalence of sickness of 188·9 per 1,000, and one of 11·30 per 1,000 in that of mortality. The admissions and deaths in the different classes and orders of diseases are shown in Abstract XXXIX.

**GENERAL DISEASES.**—*The febrile group* caused 95 admissions and 4 deaths, the ratio of admission, 159·9 per 1,000, showing a decline of 48·9 from that in the previous year; the ratio of mortality, on the other hand, 6·74 per 1,000 shows an increase of 2·52 per 1,000.

*Enteric Fever* was the cause of 12 admissions and 2 deaths. The cases occurred as follows: 7 on board the s.s. "Conway Castle" from Suakin to Alexandria; 2, one fatal, on board the s.s. "City of Oxford" during a trip to sea from Alexandria and return; and 3 cases, one fatal, on board the "Himalaya" between Malta and Singapore. It is stated of all these cases that they were contracted before embarkation. *Other continued fevers* caused 43 admissions, 36 for simple continued fever and 7 for febricula. *Paroxysmal fevers* show 38 admissions, all but one, a case of remittent fever, being cases of ague, and 23 of them occurred in one vessel, between Penang and Natal. Two cases of *cholera* are returned; they occurred on board the s.s. "Busheer" between Rangoon and Calcutta in the month of March. It is stated that both cases were of a severe type and ended fatally, and that the disease was probably contracted at Prome where it was prevalent in the bazar; the troops had halted for some hours at Prome Rest camp on the day before embarking, and both cases occurred within 24 hours after embarkation.

In the *constitutional group* of diseases 164 admissions, equal to 276·1 per 1,000 are returned; the admission ratio is considerably higher than in the previous year. *Rheumatism* shows 21 admissions, 3 for the acute form; the ratio of admission, 35·3, is more than twice as great as in 1884. The admissions for *primary syphilis* were 112 in number, and for *secondary syphilis* 30, the ratios per 1,000 being 188·6 and 50·5 respectively, as compared with 103·4 and 4·2 per 1,000 in the preceding year. 34 cases of primary syphilis occurred in one vessel alone, proceeding to Hong Kong from Cape Town, where the disease is very prevalent. Including gonorrhœa and its sequelæ, the admission rate for all forms of venereal disease was 404·1 per 1,000, as compared with 215·2 per 1,000 in 1884.

**LOCAL DISEASES.**—*Diseases of the Nervous System* caused only 4 admissions; of these two were for sunstroke, one of which proved fatal. There were 9 cases of *ophthalmic affections*, mostly conjunctivitis. 5 admissions and 2 deaths are returned under *diseases of the circulatory system*. The deaths were due to syncope and aortic aneurism respectively. *Respiratory affections* numbered 21; of these 5 were pneumonia and one pleurisy, the rest being bronchial attacks. *Diseases of the digestive system* caused 57 admissions, or 96·0 per 1,000. The principal diseases were tonsillitis 17 cases, dysentery 10, diarrhœa 10, and hepatic affections 7 cases. Of 108 admissions for *urinary diseases*, 98 were due to gonorrhœa or its sequelæ, the rate of prevalence being 165·0 per 1,000 as compared with 107·6 per 1,000 in the previous year. The remaining orders of local diseases call for no special mention, *cutaneous affections* only, chiefly ulcers and boils, causing many admissions. Seven admissions are recorded for *debility*, and four for *poisons*; the latter were cases of delirium tremens, and two were fatal.

*Injuries* caused 43 admissions, chiefly contusions, wounds, and sprains, mostly of a simple character. One death occurred from accidental drowning.

The *sanitation* of the troopships and vessels employed as transports was generally satisfactory. In one instance only it is remarked that the accommodation was insufficient, but no injurious effect appears to have resulted.

#### IV.—INVALIDS RETURNING TO ENGLAND.

The number of invalids embarked from foreign stations to England during the year was 4,513, among whom 30 deaths occurred at sea. These are accounted for in the tables showing the sickness and mortality of the Commands from which the men were invalided. There is a considerable increase in the number of invalids as compared with the previous year, but it must be remembered the invaliding from the troops serving in Egypt added considerably to it.

## ABSTRACTS

ABSTRACT No. I.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into serving in the UNITED KINGDOM during the Year 1885, with the Ratios

Orders.	Average Strength in Annual Returns, 87,105.		Admissions into Hospital.	Died.			Invalids Discharged the Service.	Average Number constantly Sick.
	†Average Strength, including Men detached, 88,331.			With the Regiment.	Absent from the Regiment.	Total.		
	Diseases.							
I.—General Diseases.								
Febrile Group.								
	Eruptive Fevers	{ Small-pox - 19	3	—	3	—	1·47	
		{ Other - 377	3	—	3	—	21·51	
	Continued „	{ Enteric - 146	42	—	42	1	17·74	
		{ Other - 991	3	1	4	—	32·17	
	Yellow Fever -	- - -	—	—	—	—	—	
	Paroxysmal Fevers -	- - -	676	—	—	—	24·20	
	Cholera -	- - -	—	—	—	—	—	
	Other diseases -	- - -	454	3	—	3	23·91	
	Total -	- - -	2,663	54	1	55	5	121·00
Constitutional Group.								
	Rheumatism -	- - 4,155	6	—	6	96	255·94	
	Primary Syphilis -	- - 11,095	—	—	—	—	889·31	
	Secondary „ -	- - 2,336	2	—	2	47	183·11	
	Tubercular Diseases -	- - 658	124	15	139	287	97·93	
	Scurvy and Purpura -	- - 15	—	—	—	—	·56	
	Other diseases -	- - 62	4	—	4	3	4·60	
	Total -	- - 18,321	136	15	151	433	1431·45	
II.—Local Diseases.								
Diseases of the—								
1	Nervous System -	- 1,063	44	6	50	305	103·48	
2	Eye -	- 1,149	—	—	—	80	66·41	
3	Ear -	- 557	—	—	—	55	31·56	
4	Nose -	- 39	—	—	—	1	1·57	
5	Circulatory System -	- 862	33	3	36	321	84·47	
6	Absorbent „ -	- 1,373	—	—	—	10	128·55	
7	Ductless Glands -	- 11	1	—	1	2	·99	
8	Respiratory System -	- 5,923	122	2	124	70	293·63	
9	Digestive „ -	- 9,946	47	7	54	148	320·43	
10	Urinary { Gonorrhœa -	- 9,741	—	—	—	—	563·38	
	System { Sequelæ of Gonorr. -	- 820	—	—	—	4	48·88	
	Other diseases -	- 1,355	14	—	14	35	59·56	
11	Generative System -	- 801	—	—	—	26	43·44	
12	Organs of Locomotion -	- 564	1	1	2	89	47·20	
13	Cellular Tissue -	- 2,418	2	—	2	14	106·92	
14	Cutaneous System -	- 8,165	—	—	—	25	305·62	
III.—Debility								
IV.—Poisons -								
V.—Injuries.								
1	General -	- 9	41	2	43	1	1·26	
2	Local -	- 9,292	36	1	37	108	378·14	
3	In action -	- —	—	—	—	1	—	
	No appreciable disease -	- 227	—	—	—	—	7·84	
	Cause unknown (refers to deaths only).	- —	3	2	5	—	—	
	General total -	- 76,426	550	40	590	1,909	4221·66	

† Ratios of deaths and invalids calculated on this strength. \* The average ratios for 10 years

## I. to XXVIII.

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS per 1,000 of the Strength and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
·2	·03	—	·02	·1	·01	—	·01
4·3	·03	—	·25	5·6	·05	—	·29
1·7	·48	·01	·20	1·3	·18	—	·15
11·4	·05	—	·37	13·7	·12	—	·43
—	—	—	—	—	—	—	—
7·8	—	—	·28	12·3	·01	·04	·41
—	—	—	—	—	—	—	—
5·2	·03	·05	·27	8·0	·09	—	·31
30·6	·62	·06	1·39	41·0	·46	·04	1·60
47·7	·07	1·09	2·94	40·4	·07	1·28	2·45
127·4	—	—	10·21	100·8	—	—	7·91
26·8	·02	·53	2·10	29·5	·02	·59	2·31
7·5	1·57	3·25	1·12	9·7	2·08	3·80	1·33
·2	—	—	·01	·2	·01	—	·02
·7	·05	·03	·05	1·3	·09	·13	·12
210·3	1·71	4·90	16·43	181·9	2·27	5·80	14·14
12·2	·57	3·45	1·19	11·9	·46	2·78	1·19
13·2	—	·91	·76	14·7	—	·82	·81
6·4	—	·62	·36	5·7	—	·58	·37
·4	—	·01	·02	·5	—	·01	·02
9·9	·41	3·63	·97	13·8	·66	4·37	1·29
15·8	—	·11	1·48	12·7	·01	·05	1·07
·1	·01	·02	·01	·1	—	·02	—
68·0	1·40	·79	3·37	72·1	1·30	1·14	3·64
114·2	·61	1·68	3·68	111·2	·49	2·03	3·77
111·8	—	—	6·47	100·3	—	—	5·75
9·4	—	·05	·56	10·9	—	·07	·70
15·6	·16	·40	·68	12·6	·15	·47	·60
9·2	—	·30	·50	10·7	—	·17	·55
6·5	·02	1·01	·54	6·5	·05	1·20	·56
27·8	·02	·16	1·23	23·8	·01	·09	1·06
93·7	—	·28	3·50	109·9	—	·34	4·13
10·8	·03	1·98	·81	10·6	·01	2·05	·79
2·1	·15	·01	·07	2·2	·11	—	·06
·1	·49	·01	·01	·1	·41	·01	·02
106·7	·42	1·22	4·34	106·7	·81	·89	4·30
—	—	·01	—	·1	—	·05	·01
2·6	—	—	·09	3·1	—	—	·10
—	·06	—	—	—	·03	—	—
877·4	6·68	21·61	48·46	863·1	6·73	22·98	46·53

will be given in future years.

ABSTRACT A.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the NORTHERN DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 11,345.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	1	—	—	·01
		{ Other - - -	30	—	—	·87
	Continued "	{ Enteric - - -	10	3	—	·81
		{ Other - - -	127	1	—	2·74
	Yellow Fever -	- - -	—	—	—	—
	Paroxysmal Fevers	- - -	62	—	—	1·38
	Cholera -	- - -	—	—	—	—
	Other diseases	- - -	64	1	1	2·75
	Total	- - -	294	5	1	8·56
	Constitutional Group.					
	Rheumatism -	- - -	617	1	15	31·14
	Primary Syphilis	- - -	1,294	—	—	85·66
	Secondary "	- - -	297	—	2	17·50
	Tubercular Diseases	- - -	78	17	31	10·59
	Scurvy and Purpura	- - -	4	—	—	·16
	Other diseases	- - -	10	1	—	·35
	Total	- - -	2,300	19	48	145·40
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System	- - -	127	6	43	13·78
2	Eye -	- - -	138	—	6	7·36
3	Ear -	- - -	47	—	8	3·84
4	Nose -	- - -	4	—	1	·18
5	Circulatory System	- - -	72	6	25	6·26
6	Absorbent "	- - -	141	—	1	11·63
7	Ductless Glands	- - -	1	—	—	·18
8	Respiratory System	- - -	786	18	9	33·76
9	Digestive "	- - -	1,040	2	11	30·59
10	Urinary { Gonorrhœa -	- - -	1,343	—	—	63·13
	System { Sequelæ of Gonorrhœa	- - -	128	—	—	6·88
		{ Other diseases -	171	3	6	6·57
11	Generative System	- - -	114	—	4	5·14
12	Organs of Locomotion	- - -	75	—	5	4·21
13	Cellular Tissue	- - -	352	—	3	12·68
14	Cutaneous System	- - -	1,051	—	7	33·45
	III.—Debility	- - -	81	1	17	5·34
	IV.—Poisons	- - -	10	3	—	·33
	V.—Injuries.					
1	General	- - -	—	4	—	—
2	Local -	- - -	1,202	2	13	43·35
3	In action	- - -	—	—	—	—
	No appreciable disease	- - -	29	—	—	·85
	Cause unknown (refers to deaths only)	- - -	—	2	—	—
	General total	- - -	9,456	71	208	443·47

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000, from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
·1	—	—	·01	·1	—	—	·01
2·6	—	—	·08	2·9	·04	—	·12
·9	·26	—	·07	·9	·19	—	·12
11·2	·09	—	·24	14·7	·02	—	·82
—	—	—	—	—	—	—	—
5·5	—	—	·12	12·0	—	—	·88
—	—	—	—	—	—	—	—
5·6	·09	·09	·24	5·8	·02	—	·19
35·9	·44	·09	·76	36·4	·27	—	1·14
54·4	·09	1·32	2·74	42·4	·10	1·44	2·34
114·0	—	—	7·55	118·1	—	—	9·12
26·2	—	·18	1·54	35·1	·04	·95	2·56
6·9	1·50	2·78	·98	11·1	2·78	3·88	1·53
·3	—	—	·01	·1	—	—	·01
·9	·09	—	·03	1·6	·04	·39	·19
202·7	1·68	4·23	12·80	208·4	2·91	6·66	15·75
11·2	·53	8·79	1·21	12·1	·49	2·80	1·13
12·2	—	·53	·65	12·5	—	·76	·58
4·2	—	·70	·34	3·5	—	·45	·22
·4	—	·09	·01	·5	—	·02	·03
6·3	·53	2·20	·55	12·1	·85	4·40	·98
12·4	—	·09	1·03	14·0	—	·12	1·20
·1	—	—	·02	—	—	—	—
64·9	1·58	·79	2·98	72·2	1·84	1·46	3·50
91·7	·18	·97	2·70	102·3	·50	2·60	3·23
118·4	—	—	5·56	125·4	—	—	6·64
11·3	—	—	·61	15·2	—	—	·99
15·1	·26	·58	·58	12·3	·25	·52	·53
10·0	—	·85	·45	12·1	—	·29	·56
6·6	—	·44	·37	6·5	·04	1·18	·50
31·0	—	·26	1·12	27·9	·02	·15	1·15
92·6	—	·62	2·95	180·3	—	·54	4·38
7·1	·09	1·50	·47	10·3	·02	1·94	·64
·9	·26	—	·03	2·8	·18	·02	·06
—	·35	—	—	·2	·43	·02	·01
105·9	·18	1·15	3·82	118·9	·39	1·24	4·25
—	—	—	—	—	—	—	—
2·6	—	—	·08	2·4	—	—	—
—	·18	—	—	—	·04	—	0·9
838·5	6·27	18·33	39·09	937·8	8·23	25·17	47·51

will be given in future years.

ABSTRACT B.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the EASTERN DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 4,038.		Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	3	—	—	·36
		{ Other - - -	30	—	—	2·64
	Continued "	{ Enteric - - -	2	2	—	·04
		{ Other - - -	42	—	—	1·11
	Yellow Fever -	- - -	—	—	—	—
	Paroxysmal Fevers	- - -	41	—	—	1·13
	Cholera -	- - -	—	—	—	—
	Other diseases	- - -	26	—	—	1·49
	Total	- - -	144	2	—	6·77
	Constitutional Group.					
	Rheumatism -	- - -	292	—	6	20·58
	Primary Syphilis	- - -	446	—	—	39·09
	Secondary "	- - -	101	—	4	9·54
	Tubercular Diseases	- - -	27	6	13	3·74
	Scurvy and Purpura	- - -	—	—	—	—
	Other diseases	- - -	6	—	1	·63
	Total	- - -	872	6	24	73·58
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System	- - -	82	4	24	7·41
2	Eye -	- - -	42	—	7	2·81
3	Ear -	- - -	26	—	5	1·80
4	Nose -	- - -	4	—	—	·10
5	Circulatory System	- - -	92	1	27	7·95
6	Absorbent "	- - -	56	—	—	3·55
7	Ductless Glands	- - -	2	—	—	·21
8	Respiratory System	- - -	405	5	3	15·88
9	Digestive "	- - -	602	2	12	20·31
		- - -	491	—	—	27·92
10	Urinary {	Gonorrhœa -	23	—	—	1·99
	System {	Sequelæ of Gonorrhœa	52	1	1	2·11
		Other diseases	41	—	5	2·48
11	Generative System	- - -	17	—	1	1·61
12	Organs of Locomotion	- - -	121	—	1	2·95
13	Cellular Tissue	- - -	508	—	—	19·56
14	Cutaneous System	- - -				
	III.—Debility		38	1	6	1·79
	IV.—Poisons		8	—	—	·31
	V.—Injuries.					
1	General	- - -	1	3	—	—
2	Local	- - -	535	1	16	24·28
3	In action	- - -	—	—	—	—
	No appreciable disease	- - -	10	—	—	·28
	Cause unknown (refers to deaths only)		—	—	—	—
	General total	- - -	4,167	26	132	225·6(7)

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
·7	—	—	·09	—	—	—	—
7·4	—	—	·65	8·3	—	—	·29
·5	·50	—	·01	·7	·16	—	·06
10·4	—	—	·28	11·6	—	—	·26
—	—	—	—	—	—	—	—
10·2	—	—	·28	17·6	—	·04	·50
—	—	—	—	—	—	—	—
6·4	—	—	·37	6·1	·08	—	·34
35·6	·50	—	1·68	44·3	·24	·04	1·45
72·3	—	1·48	5·10	47·6	—	1·62	2·85
110·4	—	—	9·68	96·9	—	—	7·00
25·0	—	·99	2·86	25·3	—	·28	2·13
6·7	1·48	3·22	·93	10·8	2·09	3·92	1·23
—	—	—	—	·1	—	·04	·01
1·5	—	·25	·15	1·3	·16	·20	·25
215·9	1·48	5·94	18·22	182·0	2·25	6·06	13·47
20·3	1·00	5·94	1·84	12·8	·52	3·13	1·18
10·4	—	1·73	·70	18·0	—	·72	·95
6·4	—	1·24	·45	5·5	—	·48	·40
1·0	—	—	·03	·7	—	—	·05
22·8	·25	6·69	1·97	14·9	·79	4·04	1·09
13·9	—	—	·88	14·7	—	—	1·03
·5	—	—	·05	—	—	—	—
100·3	1·24	·74	3·93	84·9	1·63	·76	3·78
149·1	·50	2·97	5·03	131·9	·44	2·77	4·09
121·6	—	—	6·92	105·9	—	—	5·35
5·7	—	—	·48	11·6	·03	—	·70
12·9	·25	·25	·52	9·3	·12	·24	·58
10·1	—	1·24	·60	13·9	—	·04	·76
4·2	—	·25	·40	5·6	·04	1·19	·48
30·0	—	·25	·73	25·0	·03	·04	1·06
125·8	—	—	4·84	116·0	—	·32	3·91
8·2	·25	1·48	·44	12·8	—	3·45	·86
2·0	—	—	·08	2·8	·04	—	·06
·2	·74	—	—	·1	·24	—	—
132·5	·25	3·96	6·01	106·7	·16	1·15	4·23
—	—	—	—	—	—	—	—
2·5	—	—	·07	2·0	—	—	·09
—	—	—	—	—	—	—	—
1031·9	6·44	32·69	55·87	921·4	6·53	24·43	45·57

will be given in future years.



**ABSTRACT C.**—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the WESTERN DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 5,410.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - - - -	5	—	—	·41
		{ Other - - - - -	45	—	—	2·47
	Continued "	{ Enteric - - - - -	2	1	—	·26
		{ Other - - - - -	51	—	—	2·45
	Yellow Fever -	- - - - -	—	—	—	—
	Paroxysmal Fevers -	- - - - -	51	—	—	2·78
	Cholera -	- - - - -	—	—	—	—
	Other diseases -	- - - - -	16	—	—	·43
	Total -	- - - - -	170	1	—	8·80
	Constitutional Group.					
	Rheumatism -	- - - - -	228	1	6	13·34
	Primary Syphilis -	- - - - -	530	—	—	48·05
	Secondary "	- - - - -	169	—	—	12·84
	Tubercular Diseases -	- - - - -	42	12	16	5·99
	Scurvy and Purpura -	- - - - -	—	—	—	—
	Other diseases -	- - - - -	4	1	—	·48
	Total -	- - - - -	973	14	22	80·70
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System -	- - - - -	72	—	20	7·62
2	Eye -	- - - - -	71	—	4	4·50
3	Ear -	- - - - -	43	—	4	2·23
4	Nose -	- - - - -	3	—	—	·12
5	Circulatory System -	- - - - -	63	—	16	6·85
6	Absorbent "	- - - - -	48	—	—	4·74
7	Ductless Glands -	- - - - -	—	—	—	—
8	Respiratory System -	- - - - -	303	3	1	17·46
9	Digestive "	- - - - -	544	4	11	18·29
10	Urinary { Gonorrhœa -	- - - - -	614	—	—	37·86
	System { Sequelæ of Gonorrhœa -	- - - - -	67	—	—	4·01
	Other diseases -	- - - - -	97	2	4	4·92
11	Generative System -	- - - - -	43	—	1	2·88
12	Organs of Locomotion -	- - - - -	39	—	3	2·87
13	Cellular Tissue -	- - - - -	151	—	—	6·36
14	Cutaneous System -	- - - - -	567	—	2	20·13
	III.—Debility -	- - - - -	40	—	3	2·20
	IV.—Poisons -	- - - - -	14	1	—	·50
	V.—Injuries.					
1	General -	- - - - -	—	3	—	—
2	Local -	- - - - -	610	3	3	22·74
3	In action -	- - - - -	—	—	—	—
	No appreciable disease -	- - - - -	12	—	—	·33
	Cause unknown (refers to deaths only)	- - - - -	—	—	—	—
	General total -	- - - - -	4,549	31	94	256·11

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000, from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
·9	—	—	·08	·1	—	—	·01
8·8	—	—	·46	5·1	—	—	·20
·4	·18	—	·05	·9	·37	—	·09
9·4	—	—	·45	11·4	·07	—	·42
—	—	—	—	—	—	—	—
9·4	—	—	·51	10·5	—	—	·46
—	—	—	—	—	—	—	—
8·0	—	—	·08	5·7	—	—	·22
31·4	·18	—	1·63	33·7	·44	—	1·40
42·2	·18	1·11	2·47	35·5	·08	1·49	2·48
98·0	—	—	8·88	80·4	—	—	6·85
31·2	—	—	2·37	24·6	·03	·48	2·20
7·8	2·22	2·96	1·11	10·1	2·31	3·86	1·71
—	—	—	—	·2	—	—	·01
·7	·18	—	·09	·5	·10	·07	·05
179·9	2·59	4·07	14·92	151·3	2·47	5·90	13·30
18·3	—	3·70	1·41	12·7	·37	3·01	1·27
18·1	—	·74	·88	12·4	—	1·02	·86
7·9	—	·74	·41	5·0	—	·58	·34
·6	—	—	·02	·5	—	—	·03
11·6	—	2·96	1·27	12·2	·85	3·32	1·86
8·9	—	—	·88	10·1	—	—	·88
—	—	—	—	—	—	—	—
57·0	·55	·18	3·28	58·4	·95	·85	3·22
100·6	·74	2·03	3·38	100·5	·41	2·34	3·75
118·5	—	—	7·00	119·7	—	—	7·09
12·4	—	—	·74	9·0	—	·13	·53
17·9	·37	·74	·91	13·5	·14	·48	·79
7·9	—	·18	·53	11·5	—	·10	·62
7·2	—	·55	·53	6·8	·08	·95	·65
27·9	—	—	1·17	20·0	—	·03	·97
104·8	—	·87	3·72	102·1	—	·20	3·43
7·4	—	·55	·41	8·2	—	1·49	·94
2·6	·18	—	·09	2·3	·10	—	·08
—	·55	—	—	·1	·48	—	·02
112·8	·55	·55	4·20	87·0	·20	·71	3·77
—	—	—	—	—	—	·07	·02
2·2	—	—	·06	3·2	—	—	·07
—	—	—	—	—	—	—	—
840·9	5·73	17·37	47·34	780·2	6·44	21·18	45·39

\*will be given in future years.

ABSTRACT D.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the SOUTHERN DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 7,475.	Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	<b>I.—General Diseases.</b>				
	<i>Febrile Group.</i>				
	Eruptive Fevers - { Small-pox - - - - -	1	—	—	·29
	Other - - - - -	44	—	—	2·30
	Continued „ - { Enteric - - - - -	21	6	1	4·14
	Other - - - - -	46	—	—	1·86
	Yellow Fever - - - - -	—	—	—	—
	Paroxysmal Fevers - - - - -	65	—	—	1·94
	Cholera - - - - -	—	—	—	—
	Other diseases - - - - -	39	—	—	2·08
	<b>Total - - - - -</b>	<b>216</b>	<b>6</b>	<b>1</b>	<b>12·61</b>
	<i>Constitutional Group.</i>				
	Rheumatism - - - - -	344	—	11	21·75
	Primary Syphilis - - - - -	744	—	—	52·97
	Secondary „ - - - - -	130	—	2	9·99
	Tubercular Diseases - - - - -	53	12	25	10·12
	Scurvy and Purpura - - - - -	2	—	—	·18
	Other diseases - - - - -	12	—	—	·41
	<b>Total - - - - -</b>	<b>1,285</b>	<b>12</b>	<b>38</b>	<b>95·42</b>
	<b>II.—Local Diseases.</b>				
	<i>Diseases of the—</i>				
1	Nervous System - - - - -	111	2	30	11·18
2	Eye - - - - -	114	—	10	6·85
3	Ear - - - - -	55	—	2	2·46
4	Nose - - - - -	2	—	—	·08
5	Circulatory System - - - - -	87	2	22	7·30
6	Absorbent „ - - - - -	116	—	1	12·39
7	Ductless Glands - - - - -	—	—	—	—
8	Respiratory System - - - - -	465	9	5	23·50
9	Digestive „ - - - - -	1,029	9	5	33·20
10	Urinary { Gonorrhœa - - - - -	781	—	—	43·03
	System { Sequelæ of Gonorrhœa - - - - -	61	—	—	4·02
	Other diseases - - - - -	109	1	4	4·81
11	Generative System - - - - -	73	—	—	3·82
12	Organs of Locomotion - - - - -	54	—	6	4·14
13	Cellular Tissue - - - - -	164	—	—	8·26
14	Cutaneous System - - - - -	940	—	3	33·84
	<b>III.—Debility - - - - -</b>	<b>72</b>	<b>—</b>	<b>16</b>	<b>5·82</b>
	<b>IV.—Poisons - - - - -</b>	<b>15</b>	<b>1</b>	<b>—</b>	<b>·50</b>
	<b>V.—Injuries.</b>				
1	General - - - - -	2	8	1	·43
2	Local - - - - -	737	4	7	32·06
3	In action - - - - -	—	—	—	—
	No appreciable disease - - - - -	13	—	—	·72
	Cause unknown (refers to deaths only) - - - - -	—	—	—	—
	<b>General total - - - - -</b>	<b>6,501</b>	<b>54</b>	<b>151</b>	<b>346·46</b>

\* The average ratios for 10 years.

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
.1	—	—	.04	.1	—	—	.02
5.9	—	—	.31	5.6	.02	—	.32
2.8	.80	.13	.55	.9	.12	—	.14
6.2	—	—	.25	10.8	.02	—	.86
—	—	—	—	—	—	—	—
8.7	—	—	.26	26.0	.02	.05	.93
—	—	—	—	.1	.02	—	—
5.2	—	—	.28	4.8	.12	—	.19
28.9	.80	.13	1.69	48.3	.32	.05	1.96
46.0	—	1.47	2.91	45.5	.07	1.69	3.03
99.5	—	—	7.09	70.4	—	—	5.73
17.4	—	.27	1.34	22.0	—	.55	1.88
7.1	1.61	3.34	1.35	10.1	2.61	3.87	1.78
.3	—	—	.02	.3	—	—	.03
1.6	—	—	.05	1.3	.09	.14	.16
171.9	1.61	5.08	12.76	149.6	2.77	6.25	12.61
14.8	.27	4.02	1.49	13.4	.43	3.41	1.47
15.3	—	1.34	.91	14.7	—	.89	.87
7.4	—	.27	.33	6.9	—	.64	.49
.3	—	—	.01	.8	—	.02	.02
11.6	.27	2.94	.93	17.3	.53	5.98	2.05
15.5	—	.13	1.66	12.8	—	.02	1.12
—	—	—	—	.1	—	.02	.01
62.2	1.20	.67	3.14	86.3	1.19	1.67	4.66
137.7	1.20	.67	4.44	142.6	.87	2.72	5.00
104.5	—	—	5.76	100.9	—	—	5.98
8.2	—	—	.54	10.3	—	.14	.76
14.6	.13	.54	.64	14.3	.18	.41	.74
9.8	—	—	.51	9.6	—	.21	.54
7.2	—	.80	.56	7.3	.05	1.17	.76
21.9	—	—	1.10	21.3	.02	.12	1.06
125.7	—	.40	4.53	120.7	—	.32	4.80
9.6	—	2.14	.78	12.4	—	3.02	1.12
2.0	.13	—	.07	2.4	.12	—	.06
.3	1.07	.13	.06	.2	.53	.05	.05
98.6	.54	.94	4.29	117.6	.27	1.23	5.21
—	—	—	—	.1	—	.14	.02
1.7	—	—	.10	4.2	—	—	.15
—	—	—	—	—	—	—	—
869.7	7.22	20.20	46.35	914.1	7.28	28.48	51.51

will be given in future years.

ABSTRACT E.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL the CHATHAM DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 3,395.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	7	—	—	·48
	Continued „	{ Enteric - - -	—	—	—	—
		{ Other - - -	30	—	—	·59
	Yellow Fever -	- - -	—	—	—	—
	Paroxysmal Fevers	- - -	24	—	—	·68
	Cholera -	- - -	—	—	—	—
	Other diseases	- - -	17	—	—	·88
	Total	- - -	78	—	—	2·63
	Constitutional Group.					
	Rheumatism -	- - -	166	1	8	10·04
	Primary Syphilis	- - -	461	—	—	39·45
	Secondary „	- - -	85	1	2	6·02
	Tubercular Diseases	- - -	36	3	14	4·35
	Scurvy and Purpura	- - -	—	—	—	—
	Other diseases	- - -	—	—	—	—
	Total	- - -	748	5	24	59·86
	II. Local Diseases.					
	Diseases of the—					
1	Nervous System	- - -	52	6	11	3·56
2	Eye -	- - -	34	—	4	1·28
3	Ear -	- - -	14	—	2	·60
4	Nose -	- - -	2	—	—	·03
5	Circulatory System	- - -	34	2	25	2·90
6	Absorbent „	- - -	56	—	—	5·95
7	Ductless Glands	- - -	—	—	—	—
8	Respiratory System	- - -	207	3	7	12·05
9	Digestive „	- - -	355	—	10	13·80
10	Urinary { Gonorrhœa	- - -	361	—	—	22·30
	System { Sequelæ of Gonorrhœa	- - -	37	—	—	2·19
	Other diseases	- - -	40	—	1	1·16
11	Generative System	- - -	21	—	2	1·09
12	Organs of Locomotion	- - -	37	—	11	2·77
13	Cellular Tissue	- - -	105	—	—	5·26
14	Cutaneous System	- - -	226	—	3	8·88
	III.—Debility	- - -	36	—	10	2·38
	IV.—Poisons	- - -	35	1	—	·94
	V.—Injuries.					
1	General	- - -	—	1	—	—
2	Local -	- - -	297	2	8	14·99
3	In action	- - -	—	—	—	—
	No appreciable disease	- - -	6	—	—	·13
	Cause unknown (refers to deaths only)	- - -	—	—	—	—
	General total	- - -	2,781	20	118	164·95

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	·1	·04	—	·01
2·1	—	—	·14	3·3	·04	—	·24
8·8	—	—	·17	·5	·23	—	·03
—	—	—	—	6·4	·04	—	·28
7·1	—	—	·20	8·7	—	—	—
—	—	—	—	—	—	—	·30
5·0	—	—	·26	4·1	·04	—	·20
23·0	—	—	·77	23·1	·40	—	1·06
48·9	·29	2·36	2·96	51·6	·18	2·48	3·11
135·8	—	—	11·62	75·9	—	—	6·01
25·0	·29	·59	1·77	18·6	—	·86	1·60
10·6	·88	4·12	1·28	11·1	1·67	5·22	1·23
—	—	—	—	·1	—	—	—
—	—	—	—	·5	—	·13	·03
220·3	1·47	7·07	17·63	157·8	1·85	8·69	11·98
15·3	1·77	3·24	1·05	12·0	·32	3·37	1·19
10·0	—	1·18	·38	16·9	—	1·76	1·08
4·1	—	·59	·18	9·5	—	1·85	·68
·6	—	—	·01	·4	—	·04	·01
10·0	·59	7·36	·85	19·9	·59	7·71	1·88
16·5	—	—	1·75	10·1	—	—	·69
—	—	—	—	—	—	—	—
60·9	·88	2·06	3·55	76·6	·81	1·12	3·92
104·6	—	2·95	3·92	114·4	·32	1·98	4·05
106·3	—	—	6·57	100·7	—	—	5·84
10·9	—	—	·65	11·0	—	—	·64
11·8	—	·29	·34	14·6	·04	·45	·66
6·2	—	·59	·32	8·4	—	·23	·37
10·9	—	3·24	·82	7·9	·04	2·93	·78
30·9	—	—	1·55	24·0	—	·09	1·05
66·6	—	·88	2·61	105·6	—	·31	3·65
10·6	—	2·94	·70	16·2	—	4·23	1·13
10·3	·29	—	·28	3·3	·09	—	·09
—	·29	—	—	·1	·32	—	—
87·5	·59	2·36	4·41	104·1	·49	1·49	4·51
—	—	—	—	—	—	—	—
1·8	—	—	·04	4·8	—	—	·09
—	—	—	—	—	—	—	—
819·1	5·89	34·75	48·38	840·9	5·27	35·75	45·35

will be given in future years.

ABSTRACT F.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the SOUTH-EASTERN DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 6,267.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - - - -	—	—	—	—
		{ Other - - - - -	22	—	—	1.08
	Continued "	{ Enteric - - - - -	2	2	—	.08
		{ Other - - - - -	78	—	—	2.43
	Yellow Fever - - - - -	- - - - -	—	—	—	—
	Paroxysmal Fevers - - - - -	- - - - -	102	—	—	3.25
	Cholera - - - - -	- - - - -	—	—	—	—
	Other diseases - - - - -	- - - - -	14	—	—	.57
	Total - - - - -	- - - - -	218	2	—	7.36
	Constitutional Group.					
	Rheumatism - - - - -	- - - - -	311	—	6	20.08
	Primary Syphilis - - - - -	- - - - -	804	—	—	59.31
	Secondary " - - - - -	- - - - -	247	—	4	20.85
	Tubercular Diseases - - - - -	- - - - -	54	9	33	9.89
	Scurvy and Purpura - - - - -	- - - - -	1	—	—	.04
	Other diseases - - - - -	- - - - -	4	—	—	.49
	Total - - - - -	- - - - -	1,421	9	43	110.66
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System - - - - -	- - - - -	84	3	23	8.44
2	Eye - - - - -	- - - - -	75	—	4	4.32
3	Ear - - - - -	- - - - -	40	—	4	2.22
4	Nose - - - - -	- - - - -	2	—	—	.08
5	Circulatory System - - - - -	- - - - -	98	3	30	12.84
6	Absorbent " - - - - -	- - - - -	88	—	—	6.25
7	Ductless Glands - - - - -	- - - - -	1	1	—	.08
8	Respiratory System - - - - -	- - - - -	632	7	10	27.97
9	Digestive " - - - - -	- - - - -	910	2	27	30.29
10	Urinary { Gonorrhœa - - - - -	- - - - -	714	—	—	41.62
	System { Sequelæ of Gonorrhœa - - - - -	- - - - -	61	—	1	4.14
	{ Other diseases - - - - -	- - - - -	88	—	1	3.23
11	Generative System - - - - -	- - - - -	60	—	1	3.35
12	Organs of Locomotion - - - - -	- - - - -	43	—	8	4.14
13	Cellular Tissue - - - - -	- - - - -	143	—	2	7.28
14	Cutaneous System - - - - -	- - - - -	578	—	1	20.74
	III.—Debility - - - - -	- - - - -	101	—	33	11.08
	IV.—Poisons - - - - -	- - - - -	37	1	—	.76
	V.—Injuries.					
1	General - - - - -	- - - - -	—	4	—	—
2	Local - - - - -	- - - - -	820	—	10	32.41
3	In action - - - - -	- - - - -	—	—	—	—
	No appreciable disease - - - - -	- - - - -	26	—	—	.87
	Cause unknown (refers to deaths only)	- - - - -	—	—	—	—
	General total - - - - -	- - - - -	6,240	32	198	340.18

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED AND CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	·1	—	—	·01
3·5	—	—	·17	7·5	·03	—	·32
·3	·32	—	—	·6	—	—	·06
12·5	—	—	·39	10·4	·21	—	·30
—	—	—	—	—	—	—	—
16·3	—	—	·52	30·1	·03	·11	·92
—	—	—	—	—	—	—	—
2·2	—	—	·09	7·5	·03	·05	·34
34·8	·32	—	1·17	56·2	·30	·16	1·95
49·6	—	·96	3·20	41·6	·05	1·70	2·66
128·3	—	—	9·46	63·9	—	—	5·17
39·4	—	·64	3·33	23·7	—	·92	1·97
8·6	1·44	5·26	1·58	10·1	1·43	4·13	1·53
·2	—	—	·01	·2	·03	—	·01
·6	—	—	·08	2·7	·05	·16	·18
226·7	1·44	6·86	17·66	142·2	1·56	6·91	11·52
13·4	·48	3·67	1·35	14·9	·38	3·48	1·46
12·0	—	·64	·69	18·6	—	1·32	1·21
6·4	—	·64	·35	6·7	—	·68	·48
·3	—	—	·01	·4	—	—	·01
15·6	·48	4·79	2·05	14·6	·51	5·15	1·66
14·1	—	—	1·00	8·7	·03	·08	·65
·2	·16	—	·01	·2	—	·05	·01
100·8	1·11	1·59	4·46	85·5	1·40	1·30	4·22
145·2	·32	4·31	4·83	127·6	·38	2·91	4·62
113·9	—	6·64	6·64	76·1	—	—	4·51
9·7	—	·16	·66	9·0	—	·27	·72
14·1	—	·16	·52	11·7	·13	·65	·65
9·6	—	·16	·54	10·4	—	·27	·51
6·9	—	1·27	·66	7·6	·05	1·05	·62
22·8	—	·32	1·16	22·3	—	·05	·86
92·2	—	·16	3·31	121·3	—	·43	4·72
16·1	—	5·27	1·77	12·8	—	2·48	1·04
5·9	·16	—	·12	2·9	·16	—	·09
—	·64	—	—	·2	·46	—	·01
130·8	—	1·59	5·17	130·0	·38	1·19	5·64
—	—	—	—	—	—	—	—
4·2	—	—	·14	4·2	—	—	·11
—	—	—	—	—	—	—	—
995·7	5·11	31·59	54·27	884·1	5·74	28·43	47·27

will be given in future years.



ABSTRACT G.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the HOME DISTRICT during the Year 1885, with the Ratios per

Orders.	Average Strength, 7,948.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
I.—General Diseases.						
Febrile Group.						
	Eruptive Fevers	{ Small-pox - - - - -	4	2	—	·09
		{ Other - - - - -	57	—	—	3·59
	Continued „	{ Enteric - - - - -	47	7	—	5·47
		{ Other - - - - -	144	—	—	4·94
	Yellow Fever - - - - -	- - - - -	—	—	—	—
	Paroxysmal Fevers - - - - -	- - - - -	80	—	—	·82
	Cholera - - - - -	- - - - -	—	—	—	—
	Other diseases - - - - -	- - - - -	104	1	—	3·98
	Total - - - - -	- - - - -	386	10	—	18·89
Constitutional Group.						
	Rheumatism - - - - -	- - - - -	436	—	15	24·83
	Primary Syphilis - - - - -	- - - - -	1,372	—	—	118·95
	Secondary „ - - - - -	- - - - -	293	—	7	24·19
	Tubercular Diseases - - - - -	- - - - -	88	12	45	10·26
	Scurvy and Purpura - - - - -	- - - - -	2	—	—	—
	Other diseases - - - - -	- - - - -	1	—	—	·05
	Total - - - - -	- - - - -	2,192	12	67	178·28
II.—Local Diseases.						
Diseases of the—						
1	Nervous System - - - - -	- - - - -	109	3	35	7·92
2	Eye - - - - -	- - - - -	104	—	7	5·85
3	Ear - - - - -	- - - - -	63	—	12	3·78
4	Nose - - - - -	- - - - -	2	—	—	·14
5	Circulatory System - - - - -	- - - - -	87	5	50	7·23
6	Absorbent „ - - - - -	- - - - -	118	—	3	10·21
7	Ductless Glands - - - - -	- - - - -	—	—	—	—
8	Respiratory System - - - - -	- - - - -	619	20	10	26·42
9	Digestive „ - - - - -	- - - - -	1,117	5	20	31·30
10	Urinary { Gonorrhœa - - - - -	- - - - -	938	—	—	55·18
	System { Sequelæ of Gonorrhœa - - - - -	- - - - -	95	—	2	5·67
		{ Other diseases - - - - -	131	—	3	5·83
11	Generative System - - - - -	- - - - -	82	—	4	4·75
12	Organs of Locomotion - - - - -	- - - - -	55	—	15	3·74
13	Cellular Tissue - - - - -	- - - - -	328	—	2	15·00
14	Cutaneous System - - - - -	- - - - -	762	—	5	20·57
	III.—Debility - - - - -	- - - - -	197	—	25	10·77
	IV.—Poisons - - - - -	- - - - -	18	1	—	·56
V.—Injuries.						
1	General - - - - -	- - - - -	—	1	—	—
2	Local - - - - -	- - - - -	764	4	20	27·23
3	In action - - - - -	- - - - -	—	—	—	—
	No appreciable disease - - - - -	- - - - -	17	—	—	·53
	Cause unknown (refers to deaths only)	- - - - -	—	—	—	—
	General total - - - - -	- - - - -	8,184	61	280	439·84

\* The average ratios for 10 years will

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
·5	·25	—	·01	·1	·02	—	·01
7·2	—	—	·45	5·7	·05	—	·36
5·9	·88	—	·69	2·1	·32	—	·31
18·1	—	—	·62	18·3	·07	—	·53
—	—	—	—	—	—	—	—
3·8	—	—	·10	5·0	—	·07	·17
—	—	—	—	—	—	—	—
13·1	·12	—	·50	11·8	·19	—	·41
48·6	1·26	—	2·37	42·5	·65	·07	1·79
54·9	—	1·89	3·13	43·3	·14	1·14	2·55
172·6	—	—	14·96	152·2	—	·02	11·89
36·9	—	·88	3·04	40·1	—	1·26	3·28
11·1	1·51	5·66	1·29	10·4	2·21	5·71	1·45
·2	—	—	—	·8	—	—	·03
·1	—	—	·01	1·3	·12	·21	·09
275·8	1·51	8·43	22·43	247·6	2·47	8·34	19·29
13·7	·88	4·40	1·06	11·1	·72	3·03	·89
13·1	—	·88	·74	10·1	—	·56	·56
7·9	—	1·51	·48	3·8	—	·42	·21
·2	—	—	·02	·4	—	—	·01
10·9	·64	6·29	·91	10·7	·82	4·64	·92
14·8	—	·38	1·28	13·4	—	·12	1·37
—	—	—	—	—	—	—	·01
77·9	2·52	1·26	3·32	75·7	1·26	1·98	3·73
140·9	·64	2·52	3·94	112·3	·33	1·75	3·64
118·0	—	—	6·94	97·7	—	—	5·70
11·9	—	·25	·71	12·7	—	·19	·76
16·5	—	·38	·73	11·4	·19	·86	·52
10·3	—	·50	·60	8·8	—	·21	·45
6·9	—	1·89	·47	7·2	·02	1·24	·52
41·3	—	·25	1·89	35·5	·02	·16	1·46
95·9	—	·63	2·59	93·9	—	·35	2·95
24·8	—	3·14	1·36	13·3	·02	1·68	·77
2·3	·12	—	·07	2·6	·19	—	·07
—	·12	—	—	·1	·19	—	—
95·9	·50	2·52	3·42	86·8	·16	·77	3·40
—	—	—	—	—	—	·09	—
2·1	—	—	·07	1·8	—	—	·05
—	—	—	—	—	—	—	—
1029·7	7·68	35·23	55·34	899·4	7·04	26·46	49·07

be given in future years.

o 24039,

M

ABSTRACT H.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the WOOLWICH DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 4,463.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	38	—	—	1·92
	Continued „	{ Enteric - - -	3	1	—	·38
		{ Other - - -	22	—	—	1·09
	Yellow Fever - - -	- - -	—	—	—	—
	Paroxysmal Fevers - - -	- - -	54	—	—	2·76
	Cholera - - -	- - -	—	—	—	—
	Other diseases - - -	- - -	19	—	1	1·89
	Total - - -	- - -	136	1	1	8·04
	Constitutional Group.					
	Rheumatism - - -	- - -	206	—	7	14·50
	Primary Syphilis - - -	- - -	590	—	—	59·72
	Secondary „ - - -	- - -	123	—	5	10·10
	Tubercular Diseases - - -	- - -	29	7	16	6·79
	Scurvy and Purpura - - -	- - -	1	—	—	·02
	Other diseases - - -	- - -	4	—	1	·48
	Total - - -	- - -	953	7	29	91·61
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System - - -	- - -	53	2	19	5·53
2	Eye - - -	- - -	57	—	5	8·93
3	Ear - - -	- - -	35	—	2	2·57
4	Nose - - -	- - -	3	—	—	·18
5	Circulatory System - - -	- - -	36	1	27	7·11
6	Absorbent „ - - -	- - -	68	—	1	8·99
7	Ductless Glands - - -	- - -	—	—	—	—
8	Respiratory System - - -	- - -	260	7	5	16·54
9	Digestive „ - - -	- - -	394	5	10	17·88
10	Urinary { Gonorrhœa - - -	- - -	400	—	—	33·56
	System { Sequelæ of Gonorrhœa - - -	- - -	62	—	—	3·76
		{ Other diseases - - -	85	1	3	4·48
11	Generative System - - -	- - -	26	—	—	1·81
12	Organs of Locomotion - - -	- - -	28	—	3	2·85
13	Cellular Tissue - - -	- - -	104	—	—	6·87
14	Cutaneous System - - -	- - -	313	—	—	15·13
	III.—Debility - - -	- - -	28	—	8	3·91
	IV.—Poisons - - -	- - -	2	—	—	·18
	V.—Injuries.					
1	General - - -	- - -	1	—	—	·09
2	Local - - -	- - -	434	1	7	25·38
3	In action - - -	- - -	—	—	—	—
	No appreciable disease - - -	- - -	29	—	—	·95
	Cause unknown (refers to deaths only)	- - -	—	—	—	—
	General total - - -	- - -	3,507	25	120	261·35

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	·4	—	—	·04
8·5	—	—	·43	5·9	·07	—	·35
·7	·22	—	·09	·2	·07	—	·02
4·9	—	—	·24	7·3	—	—	·26
—	—	—	—	—	—	—	—
13·1	—	—	·62	17·3	—	·04	·63
—	—	—	—	—	—	—	—
4·3	—	·22	·42	29·9	·18	—	·87
30·5	·22	·22	1·80	61·0	·32	·04	2·17
46·1	—	1·57	3·25	30·9	—	1·24	2·32
132·2	—	—	13·38	75·8	—	—	7·50
27·6	—	1·12	2·26	49·2	·03	·78	4·94
6·5	1·57	3·59	1·52	8·4	2·16	4·21	1·41
·2	—	—	—	·2	—	—	·01
·9	—	·22	·11	2·0	·11	·32	·18
213·5	1·57	6·50	20·52	166·5	2·30	6·55	16·36
11·9	·45	4·26	1·24	8·0	·46	1·94	·81
12·8	—	1·12	·88	9·8	—	·67	·66
7·8	—	·45	·58	4·3	—	·71	·36
·7	—	—	·04	·3	—	—	·02
8·1	·22	6·05	1·59	10·0	·49	4·11	1·15
15·2	—	·22	2·01	10·9	—	·07	1·32
—	—	—	—	—	—	—	—
58·3	1·57	1·12	3·71	47·2	1·38	1·77	2·93
88·3	1·12	2·24	4·01	96·3	·57	1·88	3·61
89·6	—	—	7·52	69·1	—	—	4·34
13·9	—	—	·84	14·0	—	·07	·78
19·0	·22	·67	1·00	10·2	·28	·60	·58
5·8	—	—	·41	7·1	—	·14	·43
6·3	—	·67	·64	5·8	·04	1·41	·71
23·3	—	—	1·54	17·9	—	·18	1·00
70·1	—	—	3·39	78·7	—	·39	3·65
·6	—	—	—	—	—	—	—
6·3	—	1·79	·88	7·8	—	2·02	·77
·5	—	—	·04	2·4	·18	—	·06
·2	—	—	·02	·1	·18	·08	·01
97·2	·22	1·57	5·69	78·1	·28	·64	3·90
—	—	—	—	—	—	·03	·01
6·5	—	—	·21	7·5	—	—	·09
—	—	—	—	—	·03	—	—
785·8	5·60	26·88	58·56	713·0	6·51	23·25	45·72

will be given in future years.

ABSTRACT I.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the ALDERSHOT DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 7,852.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - - - -	—	—	—	—
		{ Other - - - - -	19	—	—	1·22
	Continued "	{ Enteric - - - - -	16	9	—	1·87
		{ Other - - - - -	132	—	—	4·51
	Yellow Fever - - - - -	- - - - -	—	—	—	—
	Paroxysmal Fevers - - - - -	- - - - -	81	—	—	3·43
	Cholera - - - - -	- - - - -	—	—	—	—
	Other diseases - - - - -	- - - - -	36	1	—	1·81
	Total - - - - -	- - - - -	284	10	—	12·84
	Constitutional Group.					
	Rheumatism - - - - -	- - - - -	461	1	3	33·99
	Primary Syphilis - - - - -	- - - - -	1,368	—	—	117·72
	Secondary " - - - - -	- - - - -	179	—	5	15·33
	Tubercular Diseases - - - - -	- - - - -	51	3	23	6·51
	Scurvy and Purpura - - - - -	- - - - -	—	—	—	—
	Other diseases - - - - -	- - - - -	7	—	—	·44
	Total - - - - -	- - - - -	2,066	4	31	173·99
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System - - - - -	- - - - -	80	2	18	7·05
2	Eye - - - - -	- - - - -	97	—	5	5·37
3	Ear - - - - -	- - - - -	60	—	4	3·43
4	Nose - - - - -	- - - - -	1	—	—	·02
5	Circulatory System - - - - -	- - - - -	74	1	30	7·10
6	Absorbent " - - - - -	- - - - -	232	—	1	24·13
7	Ductless Glands - - - - -	- - - - -	1	—	—	·02
8	Respiratory System - - - - -	- - - - -	487	9	3	23·70
9	Digestive " - - - - -	- - - - -	1,118	3	15	41·41
		- - - - -	930	—	—	58·00
10	Urinary { Gonorrhœa - - - - -	- - - - -	26	—	—	1·53
	System { Sequelæ of Gonorrhœa - - - - -	- - - - -	100	1	5	6·00
	{ Other diseases - - - - -	- - - - -	81	—	—	4·16
11	Generative System - - - - -	- - - - -	50	—	12	3·40
12	Organs of Locomotion - - - - -	- - - - -	240	2	4	10·95
13	Cellular Tissue - - - - -	- - - - -	712	—	1	32·20
14	Cutaneous System - - - - -	- - - - -				
	III.—Debility - - - - -	- - - - -	62	—	6	4·87
	IV.—Poisons - - - - -	- - - - -	16	1	—	·51
	V.—Injuries.					
1	General - - - - -	- - - - -	1	4	—	—
2	Local - - - - -	- - - - -	937	6	4	39·99
3	In action - - - - -	- - - - -	—	—	—	—
	No appreciable disease - - - - -	- - - - -	25	—	—	·76
	Cause unknown (refers to deaths only)	- - - - -	—	—	—	—
	General total - - - - -	- - - - -	7,680	43	139	461·43

\* The average ratios for 10 years.

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	·1	—	—	·01
2·4	—	—	·16	8·4	·05	—	·45
2·1	1·14	—	·24	1·8	·26	—	·17
16·8	—	—	·57	15·0	·02	—	·62
—	—	—	—	—	—	—	—
10·3	—	—	·44	6·4	·02	·02	·27
—	—	—	—	—	—	—	—
4·6	·13	—	·23	6·2	·08	—	·36
36·2	1·27	—	1·64	37·4	·42	·02	1·88
58·7	·13	·88	4·33	47·9	·05	1·47	3·17
174·2	—	—	14·99	112·1	—	—	8·48
22·8	—	·64	1·95	23·9	—	·34	1·81
6·5	·88	2·98	·83	8·3	1·52	3·63	1·01
—	—	—	—	·2	·02	—	·01
·9	—	—	·06	1·3	·16	·02	·09
263·1	·51	3·95	22·16	193·7	1·75	5·46	14·57
10·2	·25	2·29	·90	12·1	·49	2·69	1·16
12·4	—	·64	·68	18·0	—	·95	·99
7·7	—	·51	·44	7·9	—	·80	·53
·1	—	—	—	·5	·58	·03	·03
9·4	·13	3·82	·90	17·0	—	6·12	1·63
29·5	—	·13	3·07	15·2	—	·02	1·27
·1	—	—	—	·1	—	—	—
62·0	1·14	·88	3·02	69·1	·95	1·10	3·98
142·4	·88	1·91	5·27	111·7	·42	2·35	4·74
118·4	—	—	7·39	105·1	—	—	6·44
3·3	—	—	·20	7·0	—	·03	·49
12·7	·13	·64	·77	10·2	·10	·57	·56
10·3	—	—	·53	12·6	·02	·16	·69
6·4	—	1·53	·48	6·0	·05	1·36	·50
30·6	·25	·51	1·89	21·2	—	·02	1·11
90·7	—	·13	4·10	103·9	—	·40	4·99
7·9	—	·76	·62	10·2	—	2·67	·76
2·1	·13	—	·07	1·6	·06	—	·06
·1	·51	—	—	·1	·26	·02	·05
119·3	·77	·51	5·09	95·5	·24	·89	4·56
—	—	—	—	—	—	—	—
3·2	—	—	·10	1·8	—	—	·10
—	—	—	—	—	—	—	—
978·1	5·47	17·71	58·77	657·9	5·34	25·66	51·09

will be given in future years.

ABSTRACT J.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the NORTH BRITISH DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 3,732.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	11	—	—	·85
	Continued "	{ Enteric - - -	6	2	—	·70
		{ Other - - -	45	—	—	1·77
	Yellow Fever	- - -	—	—	—	—
	Paroxysmal Fevers	- - -	15	—	—	·35
	Cholera	- - -	—	—	—	—
	Other diseases	- - -	37	—	—	1·24
	Total	- - -	114	2	—	4·91
	Constitutional Group.					
	Rheumatism	- - -	128	—	2	7·00
	Primary Syphilis	- - -	353	—	—	22·75
	Secondary "	- - -	76	—	—	4·48
	Tubercular Diseases	- - -	15	6	5	1·38
	Scurvy and Purpura	- - -	—	—	—	·05
	Other diseases	- - -	4	1	—	·18
	Total	- - -	576	7	7	35·84
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System	- - -	31	5	13	4·68
2	Eye	- - -	35	—	2	1·67
3	Ear	- - -	14	—	1	·44
4	Nose	- - -	3	—	—	·12
5	Circulatory System	- - -	23	—	8	2·14
6	Absorbent "	- - -	60	—	—	4·79
7	Ductless Glands	- - -	—	—	—	—
8	Respiratory System	- - -	255	5	4	13·63
9	Digestive "	- - -	372	2	5	10·02
10	Urinary { Gonorrhœa	- - -	339	—	—	18·24
	System { Sequelæ of Gonorrhœa	- - -	29	—	—	1·19
	{ Other diseases	- - -	51	2	1	1·75
11	Generative System	- - -	25	—	—	·96
12	Organs of Locomotion	- - -	13	—	1	·67
13	Cellular Tissue	- - -	90	—	—	3·20
14	Cutaneous System	- - -	308	—	—	11·71
	III.—Debility	- - -	42	—	4	2·61
	IV.—Poisons	- - -	3	3	—	·07
	V.—Injuries.					
1	General	- - -	1	2	—	·20
2	Local	- - -	421	2	4	15·59
3	In action	- - -	—	—	—	—
	No appreciable disease	- - -	5	—	—	·13
	Cause unknown (refers to deaths only)	- - -	—	—	—	—
	General total	- - -	2,810	30	50	184·56

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED AND CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	—	—	—	—
2·9	—	—	·23	8·3	·05	—	·31
1·6	·54	—	·19	·8	·26	—	·10
12·1	—	—	·47	12·2	—	—	·33
—	—	—	—	—	—	—	—
4·0	—	—	·09	16·9	·10	—	·53
—	—	—	—	—	—	—	—
9·9	—	—	·33	9·4	·10	—	·32
30·5	·54	—	1·31	47·6	·51	—	1·59
34·8	—	·54	1·87	36·9	·15	1·24	1·81
94·6	—	—	6·10	70·2	—	—	4·69
20·4	—	—	1·20	30·8	·05	·57	2·00
4·0	1·61	1·34	·37	11·4	1·85	4·53	1·42
—	—	—	·01	·2	—	—	·02
1·0	·27	—	·05	·9	·10	·05	·07
154·3	1·88	1·88	9·60	150·4	2·16	6·38	10·01
8·3	1·34	3·48	1·25	12·1	·57	8·04	·92
9·4	—	·54	·45	15·6	—	·67	·92
3·8	—	·27	·12	3·7	—	·51	·25
·8	—	—	·03	·3	—	—	·02
6·2	—	2·14	·57	14·1	·82	4·89	·98
16·1	—	—	1·28	11·1	—	·05	·75
—	—	—	—	·3	—	·05	·01
68·3	1·34	1·07	3·65	78·4	1·60	1·08	3·25
99·7	·54	1·34	2·69	105·4	·67	2·26	3·28
90·8	—	—	4·89	88·1	—	—	4·18
7·8	—	—	·32	12·6	—	·05	·65
13·7	·54	·27	·47	13·3	·26	·72	·62
6·7	—	—	·26	12·5	—	·36	·53
3·5	—	·27	·18	5·6	·10	1·24	·45
24·1	—	—	·86	27·2	·05	·15	1·17
82·5	—	—	3·14	107·1	—	·36	3·76
11·2	—	1·07	·70	10·9	—	1·96	·66
·8	·80	—	·02	1·8	·10	—	·05
—	—	—	—	—	—	—	—
·3	·54	—	·05	—	·51	—	·01
112·8	·54	1·07	4·18	123·8	·81	1·24	4·59
—	—	—	—	·9	—	·56	·07
1·3	—	—	·03	1·5	—	—	·06
—	—	—	—	—	—	—	—
752·9	8·04	13·40	36·05	844·3	7·67	25·58	38·78

will be given in future years.



ABSTRACT K.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the CHANNEL ISLANDS DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 1,548.		Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	5	—	—	·18
	Continued „	{ Enteric - - -	—	—	—	—
		{ Other - - -	16	—	—	·54
	Yellow Fever - - -	- - -	—	—	—	—
	Paroxysmal Fevers - - -	- - -	17	—	—	1·03
	Cholera - - -	- - -	—	—	—	—
	Other diseases - - -	- - -	5	—	—	·20
	Total - - -	- - -	43	—	—	1·95
	Constitutional Group.					
	Rheumatism - - -	- - -	64	—	—	2·68
	Primary Syphilis - - -	- - -	272	—	—	18·28
	Secondary „ - - -	- - -	39	—	—	2·68
	Tubercular Diseases - - -	- - -	7	3	—	1·31
	Scurvy and Purpura - - -	- - -	—	—	—	—
	Other diseases - - -	- - -	—	—	—	—
	Total - - -	- - -	382	3	—	24·95
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System - - -	- - -	16	—	3	1·30
2	Eye - - -	- - -	33	—	2	1·53
3	Ear - - -	- - -	19	—	1	·89
4	Nose - - -	- - -	2	—	—	·04
5	Circulatory System - - -	- - -	9	—	1	·68
6	Absorbent „ - - -	- - -	36	—	—	3·27
7	Ductless Glands - - -	- - -	1	—	—	·04
8	Respiratory System - - -	- - -	62	1	—	2·72
9	Digestive „ - - -	- - -	144	1	—	4·53
10	Urinary { Gonorrhœa - - -	- - -	212	—	—	11·08
	System { Sequelæ of Gonorrhœa - - -	- - -	17	—	—	1·39
	{ Other diseases - - -	- - -	39	—	—	1·41
11	Generative System - - -	- - -	15	—	—	·85
12	Organs of Locomotion - - -	- - -	9	—	2	·42
13	Cellular Tissue - - -	- - -	35	—	1	1·60
14	Cutaneous System - - -	- - -	131	—	—	5·13
	III.—Debility - - -	- - -	27	—	4	2·15
	IV.—Poisons - - -	- - -	1	—	—	·08
	V.—Injuries.					
1	General - - -	- - -	—	2	—	—
2	Local - - -	- - -	200	1	1	6·49
3	In action - - -	- - -	—	—	—	—
	No appreciable disease - - -	- - -	1	—	—	—
	Cause unknown (refers to deaths only)	- - -	—	1	—	—
	General total - - -	- - -	1,434	9	15	72·45

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	—	—	—	—
3·2	—	—	·12	1·2	—	—	·04
10·3	—	—	·35	16·4	—	—	·18
11·0	—	—	·66	4·5	—	—	·34
—	—	—	—	—	—	—	·12
3·2	—	—	·13	2·7	·12	—	·18
27·7	—	—	1·26	25·4	·12	—	·81
41·3	—	—	1·73	31·3	—	·37	1·60
175·7	—	—	11·81	130·8	—	—	10·66
25·2	—	—	1·73	30·3	—	·13	1·74
4·5	1·93	—	·85	6·1	1·74	1·61	·77
—	—	—	—	·1	—	—	—
—	—	—	—	2·8	—	—	·13
246·7	1·93	—	16·12	201·4	1·74	2·11	14·90
10·8	—	1·94	·84	8·7	·25	1·74	·70
21·3	—	1·29	·99	14·6	—	·37	·61
12·3	—	·65	·57	4·8	—	·37	·25
1·3	—	—	·03	·6	—	—	·03
5·8	—	·65	·44	11·2	·37	1·86	·62
23·3	—	—	2·11	24·1	—	—	2·25
·7	—	—	·03	·1	—	—	·01
40·1	·65	—	1·76	61·7	·62	·99	2·60
93·0	·65	—	2·92	101·9	·25	·99	3·00
137·0	—	—	7·16	168·6	—	—	8·83
11·0	—	—	·90	21·3	—	—	1·15
25·2	—	—	·91	17·8	—	·25	·62
9·7	—	—	·55	9·8	—	—	·39
5·8	—	1·29	·27	5·8	—	·75	·68
22·6	—	·65	1·03	18·4	—	—	·60
84·6	—	—	3·32	125·6	—	·12	4·06
17·4	—	2·58	1·38	8·4	—	1·86	·65
·7	—	—	·02	4·6	·12	—	·08
—	1·29	—	—	·4	·99	·13	·09
129·2	·65	·64	4·19	137·5	·25	·99	4·67
—	—	—	—	—	—	—	—
·7	—	—	—	2·6	—	—	·08
—	·65	—	—	—	—	—	—
926·4	5·81	9·69	46·80	975·3	4·71	12·53	47·68

will be given in future years.

ABSTRACT L.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the BELFAST DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 3,215.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - - - -	5	1	—	·31
		{ Other - - - - -	9	—	—	·33
	Continued „	{ Enteric - - - - -	1	—	—	·15
		{ Other - - - - -	42	—	—	1·39
	Yellow Fever	- - - - -	—	—	—	—
	Paroxysmal Fevers	- - - - -	5	—	—	·12
	Cholera	- - - - -	—	—	—	—
	Other diseases	- - - - -	12	—	1	1·18
	Total	- - - - -	74	1	1	3·48
	Constitutional Group.					
	Rheumatism	- - - - -	94	—	2	4·60
	Primary Syphilis	- - - - -	353	—	—	25·12
	Secondary „	- - - - -	90	—	6	6·35
	Tubercular Diseases	- - - - -	29	4	15	3·06
	Scurvy and Purpura	- - - - -	2	—	—	·03
	Other diseases	- - - - -	—	—	—	—
	Total	- - - - -	568	4	23	39·16
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System	- - - - -	41	—	17	5·00
2	Eye	- - - - -	42	—	5	2·02
3	Ear	- - - - -	17	—	—	·58
4	Nose	- - - - -	2	—	—	·07
5	Circulatory System	- - - - -	17	3	7	1·05
6	Absorbent „	- - - - -	51	—	—	3·77
7	Ductless Glands	- - - - -	—	—	—	—
8	Respiratory System	- - - - -	172	9	2	8·54
9	Digestive „	- - - - -	255	3	6	6·25
10	Urinary { Gonorrhœa	- - - - -	331	—	—	15·10
	System { Sequelæ of Gonorrhœa	- - - - -	42	—	—	2·27
		{ Other diseases	43	—	1	1·42
11	Generative System	- - - - -	34	—	2	1·10
12	Organs of Locomotion	- - - - -	17	—	3	·92
13	Cellular Tissue	- - - - -	93	—	1	5·14
14	Cutaneous System	- - - - -	276	—	1	9·66
	III.—Debility	- - - - -	24	—	8	1·32
	IV.—Poisons	- - - - -	3	—	—	·13
	V.—Injuries.					
1	General	- - - - -	—	3	—	—
2	Local	- - - - -	270	2	3	9·13
3	In action	- - - - -	—	—	—	—
	No appreciable disease	- - - - -	11	—	—	·36
	Cause unknown (refers to deaths only)	- - - - -	—	—	—	—
	General total	- - - - -	2,383	25	80	116·47

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
1·6	·81	—	·10	·1	·06	—	—
2·8	—	—	·10	3·8	·06	—	·25
·3	—	—	·05	·4	·12	—	·09
13·0	—	—	·43	19·8	·19	—	·45
—	—	—	—	—	—	—	—
1·6	—	—	·04	5·2	—	·06	·13
—	—	—	—	—	—	—	—
3·7	—	·31	·37	7·1	—	—	·27
23·0	·31	·31	1·09	36·4	·43	·06	1·19
29·3	—	·62	1·43	37·0	·06	1·56	1·96
109·8	—	—	7·81	111·2	—	—	7·78
28·0	—	1·87	1·98	25·9	·06	·37	1·76
9·0	1·25	4·66	·95	9·8	2·06	3·80	1·22
·6	—	—	·01	·2	—	—	·02
—	—	—	—	·5	·06	—	·04
176·7	1·25	7·15	12·18	184·6	2·24	5·73	12·78
12·7	—	5·29	1·56	11·9	·50	2·99	1·28
13·1	—	1·56	·63	15·4	—	1·00	·80
5·3	—	—	·18	5·5	—	·69	·27
·6	—	—	·02	·6	—	—	·02
5·3	·93	2·18	·32	11·7	1·00	2·61	·77
15·9	—	—	1·17	15·1	—	—	1·23
—	—	—	—	·1	—	—	·01
53·5	2·80	·62	2·66	62·7	1·31	1·43	2·77
79·3	·93	1·87	1·94	94·5	·50	1·50	2·59
102·9	—	—	4·70	106·8	—	—	5·88
13·1	—	—	·71	7·3	—	·06	·54
13·4	—	·31	·44	11·1	·25	·37	·44
10·6	—	·62	·34	10·6	—	·31	·37
5·3	—	·93	·29	4·6	·06	1·18	·36
28·9	—	·31	1·60	22·2	—	—	·73
85·8	—	·31	3·00	110·3	—	·37	3·76
7·5	—	2·49	·41	12·2	—	2·55	·70
·9	—	—	·04	2·4	·12	—	·06
—	·93	—	—	·2	·37	—	·01
84·0	·62	·93	2·84	94·2	·19	·87	3·19
—	—	—	—	—	—	—	—
3·4	—	—	·11	2·3	—	—	·11
—	—	—	—	—	—	—	—
741·2	7·77	24·88	36·23	822·7	6·97	21·72	39·86

will be given in future years.

ABSTRACT M.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the DUBLIN DISTRICT during the Year 1885, with the Ratios

Orders.	Average Strength, 8,668.				Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.							
	I.—General Diseases.							
	Febrile Group.							
	Eruptive Fevers	{ Small-pox	-	-	—	—	—	—
		{ Other	-	-	28	—	—	1·36
	Continued „	{ Enteric	-	-	24	6	—	2·60
		{ Other	-	-	132	1	—	4·74
	Yellow Fever	-	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	-	58	—	—	2·39
	Cholera	-	-	-	—	—	—	—
	Other diseases	-	-	-	40	—	1	3·66
	Total	-	-	-	282	7	1	14·75
	Constitutional Group.							
	Rheumatism	-	-	-	357	1	10	26·35
	Primary Syphilis	-	-	-	1,645	—	—	128·12
	Secondary „	-	-	-	308	1	6	25·68
	Tubercular Diseases	-	-	-	62	10	23	10·45
	Scurvy and Purpura	-	-	-	2	—	—	·09
	Other diseases	-	-	-	4	—	1	·22
	Total	-	-	-	2,378	12	40	190·84
	II.—Local Diseases.							
	Diseases of the—							
1	Nervous System	-	-	-	96	4	29	12·33
2	Eye	-	-	-	132	—	9	9·15
3	Ear	-	-	-	46	—	8	3·40
4	Nose	-	-	-	4	—	—	·12
5	Circulatory System	-	-	-	74	6	17	6·19
6	Absorbent „	-	-	-	159	—	1	15·45
7	Ductless Glands	-	-	-	—	—	—	—
8	Respiratory System	-	-	-	476	12	7	29·58
9	Digestive „	-	-	-	750	3	7	25·49
10	Urinary { Gonorrhœa	-	-	-	1,297	—	—	78·83
	System { Sequelæ of Gonorrhœa	-	-	-	94	—	1	4·98
	{ Other diseases	-	-	-	169	3	2	8·53
11	Generative System	-	-	-	77	—	4	4·92
12	Organs of Locomotion	-	-	-	60	1	8	8·84
13	Cellular Tissue	-	-	-	211	—	—	10·75
14	Cutaneous System	-	-	-	718	—	1	29·64
	III.—Debility	-	-	-	80	—	16	8·02
	IV.—Poisons	-	-	-	15	1	1	·66
	V.—Injuries.							
1	General	-	-	-	2	5	—	·28
2	Local	-	-	-	707	2	3	30·71
3	In action	-	-	-	—	—	1	—
	No appreciable disease	-	-	-	15	—	—	·77
	Cause unknown (refers to deaths only)	-	-	-	—	—	—	—
	General total	-	-	-	7,842	56	156	494·23

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	·3	—	—	·02
3·2	—	—	·16	5·5	·08	—	·27
2·8	·69	—	·30	2·1	·35	—	·22
15·2	·12	—	·55	16·3	·08	—	·56
—	—	—	—	—	—	—	—
6·7	—	—	·27	5·0	·02	·05	·15
—	—	—	—	—	—	—	—
4·6	—	·12	·42	6·2	·16	—	·23
32·5	·81	·12	1·70	35·4	·69	·05	1·45
41·2	·12	1·15	3·04	35·0	·07	·81	1·98
189·8	—	—	14·78	142·9	—	—	11·26
35·5	·12	·69	2·96	38·3	·03	·55	2·63
7·2	1·15	2·65	1·21	8·6	1·48	3·74	1·17
·2	—	—	—	·3	—	—	·02
·5	—	·12	·03	·9	·03	·03	·07
274·4	1·39	4·61	22·02	226·0	1·61	5·13	17·13
11·2	·46	3·35	1·42	11·1	·47	2·98	1·56
15·2	—	1·04	1·06	15·2	—	·77	·77
5·3	—	·92	·39	5·3	—	·58	·30
·5	—	—	·01	·5	—	·03	·02
8·5	·69	1·96	·72	18·4	·60	3·74	1·24
18·3	—	·12	1·78	15·0	—	·05	1·27
—	—	—	—	—	—	·07	—
54·9	1·88	·80	3·41	75·3	1·35	·77	3·81
86·5	·34	·80	2·94	98·4	·48	1·69	3·05
149·6	—	—	9·09	116·9	—	—	7·12
10·9	—	·12	·58	11·6	—	·02	·73
19·5	·34	·23	·98	16·6	·13	·37	·71
8·9	—	·46	·57	11·6	—	·11	·63
6·9	·12	·92	1·02	6·7	·02	1·32	·56
24·4	—	—	1·24	23·0	—	·14	1·02
82·8	—	·12	3·42	113·9	—	·37	4·33
9·2	—	1·84	·93	7·7	—	1·08	·56
1·7	·12	·12	·08	1·9	·08	—	·05
·2	·58	—	·03	·1	·56	—	—
81·6	·23	·35	3·54	110·7	·36	·53	4·20
—	—	·12	—	—	—	—	—
1·7	—	—	·09	2·7	—	—	·12
—	—	—	—	—	—	—	—
904·7	6·46	18·00	57·02	919·0	6·35	19·82	50·63

will be given in future years.

ABSTRACT N.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the CORK DISTRICT during the Year 1885, with the Ratios per

Orders.	Average Strength, 8,385.		Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	30	3	—	2·09
	Continued „	{ Enteric - - -	11	2	—	1·28
		{ Other - - -	66	1	—	1·69
	Yellow Fever - - -	- - -	—	—	—	—
	Paroxysmal Fevers - - -	- - -	46	—	—	1·28
	Cholera - - -	- - -	—	—	—	—
	Other diseases - - -	- - -	17	—	—	·99
	Total - - -	- - -	170	6	—	7·33
	Constitutional Group.					
	Rheumatism - - -	- - -	325	1	5	17·84
	Primary Syphilis - - -	- - -	427	—	—	31·89
	Secondary „ - - -	- - -	134	—	3	10·97
	Tubercular Diseases - - -	- - -	55	13	16	8·86
	Scurvy and Purpura - - -	- - -	1	—	—	·06
	Other diseases - - -	- - -	2	1	—	·65
	Total - - -	- - -	944	15	24	70·27
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System - - -	- - -	73	5	16	5·15
2	Eye - - -	- - -	131	—	8	6·27
3	Ear - - -	- - -	57	—	1	1·82
4	Nose - - -	- - -	2	—	—	·18
5	Circulatory System - - -	- - -	68	3	26	6·00
6	Absorbent „ - - -	- - -	75	—	1	5·64
7	Ductless Glands - - -	- - -	5	—	2	·46
8	Respiratory System - - -	- - -	555	7	4	27·19
9	Digestive „ - - -	- - -	927	6	8	26·50
10	Urinary { Gonorrhœa - - -	- - -	665	—	—	34·37
	System { Sequelæ of Gonorrhœa - - -	- - -	57	—	—	3·32
	Other diseases - - -	- - -	111	—	—	4·44
11	Generative System - - -	- - -	75	—	2	3·74
12	Organs of Locomotion - - -	- - -	47	—	6	3·76
13	Cellular Tissue - - -	- - -	192	—	—	6·05
14	Cutaneous System - - -	- - -	756	—	1	29·09
	III.—Debility - - -	- - -	89	1	13	6·13
	IV.—Poisons - - -	- - -	8	—	—	·20
	V.—Injuries.					
1	General - - -	- - -	1	1	—	·26
2	Local - - -	- - -	930	2	6	35·31
3	In action - - -	- - -	—	—	—	—
	No appreciable disease - - -	- - -	21	—	—	·84
	Cause unknown (refers to deaths only) - - -	- - -	—	—	—	—
	General total - - -	- - -	5,959	46	118	284·32

\* The average ratios for 10 years

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.				Average Ratio per 1,000 from 1879 to 1884.			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
—	—	—	—	—	—	—	—
3·6	·36	—	·25	3·7	·17	—	·23
1·8	·24	—	·15	3·1	·43	—	·33
7·9	·12	—	·21	17·5	·04	—	·52
—	—	—	—	—	—	—	—
5·5	—	—	·15	9·6	—	—	·26
—	—	—	—	—	—	—	—
2·1	—	—	·12	7·8	·06	—	·25
20·4	·72	—	·88	41·7	·70	—	1·59
39·0	·12	·60	2·14	31·7	—	·66	1·63
51·2	—	—	3·83	62·5	—	—	4·56
16·1	—	·36	1·31	20·8	·02	·19	1·42
6·6	1·56	1·92	1·06	9·2	1·60	2·86	1·05
·1	—	—	·01	·2	—	—	·02
·2	·12	—	·08	1·4	·13	·11	·09
113·2	1·80	2·88	8·43	125·8	1·75	3·82	8·77
8·8	·60	1·92	·62	11·6	·84	2·58	·99
15·7	—	·96	·75	14·5	—	·68	·66
6·8	—	·12	·22	6·3	—	·34	·33
·2	—	—	·02	·7	—	—	·03
8·2	·36	3·12	·72	12·0	·49	2·84	·94
9·0	—	·12	·68	8·0	·02	·06	·48
·6	—	·24	·05	·1	—	—	·01
66·6	·84	·48	3·26	60·8	1·00	·54	2·58
111·2	·72	·96	3·18	107·9	·32	1·24	2·99
79·8	—	—	4·12	64·3	—	—	3·48
6·8	—	—	·40	8·5	—	·06	·56
13·8	—	—	·53	10·6	·04	·26	·42
9·0	—	·24	·45	9·4	—	·06	·44
5·7	—	·72	·45	6·0	·09	·83	·42
28·0	—	—	·73	22·5	—	·04	·97
90·7	—	·12	3·49	108·9	—	·22	3·94
10·7	·12	1·56	·74	8·6	·02	1·28	·60
1·0	—	—	·02	1·2	·06	—	·04
·1	·12	—	·03	·1	·30	—	·01
111·6	·24	·72	4·24	115·7	·37	·62	3·84
—	—	—	—	—	—	—	—
2·5	—	—	·10	3·1	—	—	·08
—	—	—	—	—	—	—	—
714·9	5·52	14·16	34·11	748·3	5·50	15·47	34·17

will be given in future years.



ABSTRACT O.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed in the CURRAGH DISTRICT during the Year 1885, with the

Orders.	Average Strength, 3,414.		Admissions into Hospital.	Deaths.	Invalids discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	2	—	—	·13
	Continued "	{ Enteric - - -	1	1	—	·01
		{ Other - - -	18	—	—	·32
	Yellow Fever - - -	- - -	—	—	—	—
	Paroxysmal Fevers - - -	- - -	25	—	—	·86
	Cholera - - -	- - -	—	—	—	—
	Other diseases - - -	- - -	8	—	—	·76
	Total - - -	- - -	54	1	—	2·08
	Constitutional Group.					
	Rheumatism - - -	- - -	126	—	—	7·22
	Primary Syphilis - - -	- - -	436	—	—	42·23
	Secondary " - - -	- - -	65	—	1	6·59
	Tubercular Diseases - - -	- - -	32	7	12	4·63
	Scurvy and Purpura - - -	- - -	—	—	—	—
	Other diseases - - -	- - -	4	—	—	·22
	Total - - -	- - -	663	7	13	60·89
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System - - -	- - -	36	1	4	2·53
2	Eye - - -	- - -	44	—	2	3·50
3	Ear - - -	- - -	21	—	1	1·50
4	Nose - - -	- - -	3	—	—	·11
5	Circulatory System - - -	- - -	28	—	10	2·87
6	Absorbent " - - -	- - -	69	—	1	7·79
7	Ductless Glands - - -	- - -	—	—	—	—
8	Respiratory System - - -	- - -	284	8	—	14·69
9	Digestive " - - -	- - -	389	—	1	11·07
10	Urinary { Gonorrhœa - - -	- - -	325	—	—	23·16
	System { Sequelæ of Gonorrhœa - - -	- - -	21	—	—	1·54
	Other diseases - - -	- - -	69	—	3	2·90
11	Generative System - - -	- - -	34	—	1	2·44
12	Organs of Locomotion - - -	- - -	20	—	5	2·84
13	Cellular Tissue - - -	- - -	89	—	—	4·57
14	Cutaneous System - - -	- - -	319	—	—	15·89
	III.—Debility - - -		28	—	6	1·69
	IV.—Poisons - - -		2	—	—	·12
	V.—Injuries.					
1	General - - -	- - -	—	—	—	—
2	Local - - -	- - -	428	4	3	18·49
3	In action - - -	- - -	—	—	—	—
	No appreciable disease - - -	- - -	7	—	—	·32
	Cause unknown (refers to death only)	- - -	—	—	—	—
	General total - - -	- - -	2,933	21	50	180·99

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS  
 Ratios per 1,000 of the Strength and the average Ratios for 10 Years.\*

Ratio per 1,000.				Average ratio per 1,000 from 1883 to 1884.			
Ad- missions.	Deaths.	Invalids discharged the Service.	Constantly Sick.	Ad- missions.	Deaths.	Invalids discharged the Service.	Constantly Sick.
—	—	—	—	—	—	—	—
·6	—	—	·04	1·7	—	—	·17
·3	·29	—	—	·6	—	—	·08
5·3	—	—	·10	9·3	—	—	·27
—	—	—	—	—	—	—	—
7·3	—	—	·25	6·4	—	·31	·31
—	—	—	—	—	—	—	—
2·3	—	—	·22	3·1	·16	—	·13
15·8	·29	—	·61	21·1	·16	·31	·96
36·9	—	—	2·11	32·4	—	1·24	2·06
127·7	—	—	12·37	140·4	—	—	12·41
19·0	—	·29	1·93	20·8	—	·31	1·81
9·4	2·05	3·52	1·36	7·3	1·24	2·80	1·12
—	—	—	—	·5	—	—	·02
1·2	—	—	·06	2·6	—	·16	·27
194·2	2·05	3·81	17·83	204·0	1·24	4·51	17·69
10·5	·29	1·17	·74	9·0	·16	1·71	·69
12·9	—	·59	1·03	12·0	—	·16	·52
6·1	—	·29	·44	5·0	—	·47	·27
·9	—	—	·03	—	—	—	—
8·2	—	2·93	·84	14·3	·31	3·11	·93
20·2	—	·29	2·28	16·0	—	·15	1·29
—	—	—	—	·2	—	—	—
83·2	2·34	—	4·30	75·4	·62	·47	4·91
113·9	—	·29	3·24	100·1	—	·93	3·31
95·2	—	—	6·78	70·9	—	—	4·45
6·1	—	—	·45	10·6	—	—	·75
20·2	—	·88	·85	23·2	—	·31	·78
10·0	—	·29	·71	10·3	—	—	·68
5·9	—	1·46	·88	4·5	·15	·62	·41
26·1	—	—	1·34	21·1	—	·15	·86
93·4	—	—	4·65	90·2	—	—	3·38
8·2	—	1·76	·50	8·2	—	·78	1·03
·6	—	—	·04	1·1	—	—	·02
—	—	—	—	—	·16	—	—
125·4	1·17	·88	5·42	102·0	—	·62	4·01
—	—	—	—	—	—	—	—
2·1	—	—	·10	5·7	—	—	·18
—	—	—	—	—	—	—	—
859·1	6·15	14·64	53·01	804·9	2·80	14·30	47·12

will be given in future years.

o 24039.

N

ABSTRACT P.—TABLE showing the AVERAGE STRENGTH, SICKNESS, and MORTALITY, the ratios per 1,000

Orders.	Average Strength.		Officers, 3,160.			
	Diseases.		Attacks of Illness.	Deaths.	Ratios per 1,000.	
					Attacks.	Deaths.
	I.—General Diseases.					
	Febrile Group.					
	Eruptive fevers	{ Small-pox - - -	—	—	—	—
		{ Other - - -	8	—	2·5	—
	Continued "	{ Enteric - - -	9	1	2·8	·32
		{ Other - - -	29	1	9·2	·32
	Yellow Fevers	- - -	—	—	—	—
	Paroxysmal Fever	- - -	30	1	9·5	·32
	Cholera	- - -	—	—	—	—
	Other diseases	- - -	12	—	3·8	—
	Total	- - -	88	3	27·8	·95
	Constitutional Group.					
	Rheumatism	- - -	80	2	25·3	·63
	Primary Syphilis	- - -	2	—	·6	—
	Secondary "	- - -	1	—	·3	—
	Tubercular Diseases	- - -	4	—	1·3	—
	Scurvy and Purpura	- - -	—	—	—	—
	Other diseases	- - -	4	2	1·3	·63
	Total	- - -	91	4	28·8	1·26
	II.—Local Diseases.					
	Diseases of the—					
1	Nervous System	- - -	32	3	10·1	·95
2	Eye	- - -	12	—	3·8	—
3	Ear	- - -	2	—	·6	—
4	Nose	- - -	—	—	—	—
5	Circulatory System	- - -	5	5	1·6	1·58
6	Absorbent "	- - -	18	—	5·7	—
7	Ductless Glands	- - -	—	—	—	—
8	Respiratory System	- - -	134	3	42·4	·95
9	Digestive "	- - -	185	1	58·6	·32
10	Urinary {	Gonorrhœa - - -	19	—	6·0	—
	System {	Sequelæ of Gonorrhœa - - -	8	—	2·5	—
		Other diseases - - -	17	—	5·4	—
11	Generative System	- - -	14	—	4·4	—
12	Organs of Locomotion	- - -	17	—	5·4	—
13	Cellular Tissue	- - -	27	—	8·6	—
14	Cutaneous System	- - -	37	—	11·7	—
	III.—Debility	- - -	15	—	4·8	—
	IV.—Poisons	- - -	—	—	—	—
	V.—Injuries.	- - -	—	—	—	—
1	General	- - -	—	—	—	—
2	Local	- - -	201	5	63·6	1·58
3	In action	- - -	—	—	—	—
	No appreciable disease	- - -	—	—	—	—
	Cause unknown (refers to death only)	- - -	—	—	—	—
	General total	- - -	922	24	291·8	7·60

among the OFFICERS, WOMEN, and CHILDREN in the UNITED KINGDOM in 1885, with of the strength.

Women, 8,825.				Children, 16,112.			
Attacks of Illness.	Deaths.	Ratios per 1,000.		Attacks of Illness.	Deaths.	Ratios per 1,000.	
		Attacks.	Deaths.			Attacks.	Deaths.
2	—	·2	—	3	1	·2	·06
37	3	4·2	·34	1,576	43	97·8	2·67
3	—	·3	—	16	2	1·0	·12
55	—	6·2	—	260	2	16·1	·12
—	—	—	—	—	—	—	—
36	—	4·1	—	23	—	1·4	—
—	—	—	—	—	—	—	—
41	1	4·7	·12	429	20	26·6	1·25
174	4	19·7	·46	2,307	68	143·1	4·22
177	1	20·0	·12	23	—	1·4	—
1	—	·1	—	—	—	—	—
15	—	1·7	—	15	5	·9	·31
80	25	9·1	2·83	128	39	8·0	2·42
1	—	·1	—	—	—	—	—
66	2	7·5	·22	45	3	2·8	·19
340	28	38·5	3·17	211	47	13·1	2·92
187	2	21·2	·22	215	81	13·3	5·03
37	—	4·2	—	98	—	6·1	—
4	—	·5	—	24	1	1·5	·06
2	—	·2	—	2	—	·1	—
44	1	5·0	·12	12	1	·7	·06
8	—	·9	—	51	—	3·2	—
2	—	·2	—	—	—	—	—
600	11	68·0	1·25	2,041	124	126·7	7·69
828	12	93·8	1·36	1,177	52	73·1	3·23
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
14	1	1·6	·12	14	1	·9	·06
339	6	38·4	·68	11	—	·7	—
11	—	1·3	—	20	—	1·2	—
63	—	7·1	—	77	—	4·8	—
83	—	9·4	—	408	—	25·3	—
543	2	61·5	·22	328	30	20·3	1·86
2	—	·2	—	1	—	·1	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
49	—	5·6	—	233	4	14·5	·19
—	—	—	—	—	—	—	·25
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
3,330	67	377·3	7·55	7,230	412	448·7	25·57

ABSTRACT No. II.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at GIBRALTAR during the year 1835, with the Ratios per

Orders.	Average Strength, 4,353.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.								
	Febrile Group.								
	Eruptive Fevers	{ Small-pox	—	—	—	—	—	—	—
		{ Other	27	1	—	1	—	—	·03
	Continued "	{ Enteric	25	4	1	5	—	—	3·80
		{ Other	672	2	—	2	4	—	38·43
	Yellow Fever	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	2	—	—	—	—	—	·05
	Cholera	-	2	2	—	2	—	—	·01
	Other Diseases	-	2	—	—	—	—	—	·04
	Total	-	730	9	1	10	4	—	42·36
	Constitutional Group.								
	Rheumatism	-	239	—	—	—	12	3	14·72
	Primary Syphilis	-	747	—	—	—	1	—	49·78
	Secondary "	-	140	—	—	—	6	2	10·17
	Tubercular diseases	-	21	4	1	5	8	8	4·06
	Scurvy and Purpura	-	—	—	—	—	—	—	—
	Other Diseases	-	1	—	—	—	1	1	·08
	Total	-	1,148	4	1	5	28	14	78·81
	II.—Local Diseases.								
	Diseases of the—								
1	Nervous System	-	44	3	—	3	12	9	4·23
2	Eye	-	83	—	—	—	9	6	4·88
3	Ear	-	41	—	—	—	3	2	2·04
4	Nose	-	4	—	—	—	—	—	·08
5	Circulatory System	-	54	1	1	2	15	13	4·96
6	Absorbent "	-	63	—	—	—	1	—	6·87
7	Ductless Glands	-	2	—	—	—	1	1	·14
8	Respiratory System	-	124	2	—	2	5	3	7·26
9	Digestive "	-	430	4	—	4	1	—	13·48
10	Urinary { Gonorrhœa	-	659	—	—	—	—	—	33·80
	System { Sequelæ of Gonorrh.	-	30	—	—	—	—	1	1·61
	Other diseases	-	63	1	—	1	—	2	3·65
11	Generative System	-	62	—	—	—	2	1	3·93
12	Organs of Locomotion	-	12	—	1	1	3	4	·68
13	Cellular Tissue	-	114	—	—	—	—	—	3·52
14	Cutaneous System	-	276	—	—	—	1	—	11·80
	III.—Debility	-	118	—	—	—	81	3	9·19
	IV.—Poisons	-	22	1	—	1	—	—	·40
	V.—Injuries.								
1	General	-	1	2	—	2	—	—	·01
2	Local	-	496	4	—	4	5	4	19·57
3	In action	-	—	—	—	—	—	—	—
	No appreciable disease	-	11	—	—	—	—	—	·31
	Cause unknown (refers to deaths only).	-	—	—	—	—	—	—	—
	General total	-	4,587	31	4	35	171	63	253·58
	Average of 10 years, 1875–84		—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the Troops 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	·2	—	—	—	·02
6·2	·23	—	—	·01	·8	—	—	—	·05
5·7	1·15	—	—	·87	2·4	1·02	·11	—	·28
154·3	·46	·92	—	8·83	154·4	·84	2·77	—	9·16
—	—	—	—	—	—	—	—	—	—
·5	—	—	—	·01	48·9	·55	5·75	·48	1·80
·5	·46	—	—	—	—	—	—	—	—
·5	—	—	—	·01	1·4	·07	—	—	·08
167·7	2·30	·92	—	9·73	208·1	2·48	8·63	·48	11·39
54·9	—	2·75	·69	3·38	46·5	—	3·53	·55	4·04
171·6	—	·23	—	11·44	94·5	—	—	—	8·35
32·2	—	1·38	·46	2·34	18·6	—	·62	·22	·98
4·8	1·15	1·84	1·84	·93	4·9	·98	2·48	1·85	·69
—	—	—	—	—	·3	—	—	—	·02
·2	—	·23	·23	·02	·5	·18	·15	·11	·06
263·7	1·15	6·43	3·22	18·11	160·3	1·16	6·78	2·73	14·14
10·1	·69	2·75	2·07	·97	5·3	·15	1·57	·66	·55
19·1	—	2·07	1·38	1·12	13·4	—	1·02	·84	·84
9·4	—	·69	·46	·47	5·3	—	·40	·40	·28
·9	—	—	—	·02	·6	—	—	—	·03
12·4	·46	3·44	2·99	1·14	8·0	·69	3·20	2·29	·75
14·5	—	·23	—	1·58	20·9	—	·22	·08	2·05
·5	—	·23	·23	·03	·2	—	·03	·03	·03
28·5	·46	1·15	·69	1·67	34·9	·69	2·08	·80	2·68
98·8	·92	·23	—	3·10	94·5	·40	1·78	1·02	3·81
151·4	—	—	—	7·76	91·0	—	—	—	5·43
6·9	—	—	·23	·37	6·4	—	—	·03	·38
14·5	·23	—	·46	·84	11·3	·11	·66	·29	·73
14·2	—	·46	·23	·90	15·4	—	·07	·08	·97
2·8	·23	·69	·92	·16	4·9	—	·77	·87	·42
26·2	—	—	—	·81	25·3	—	·22	·11	1·17
63·4	—	·23	—	2·71	45·3	—	·14	·08	2·14
27·1	—	18·61	·69	2·11	11·2	—	4·08	1·27	·95
5·1	·23	—	—	·09	5·5	·04	—	—	·17
·2	·46	—	—	—	·1	·29	—	—	·01
113·9	·92	1·15	·92	4·49	85·1	·44	·99	·84	3·64
—	—	—	—	—	—	—	—	—	—
2·5	—	—	—	·07	1·4	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
1053·8	8·04	39·28	14·50	58·25	854·4	6·45	32·64	12·90	52·62
780·0	6·66	29·73	13·68	46·71	—	—	—	—	—

will be given in future years.

ABSTRACT No. III.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed at MALTA during the year 1885, with the Ratios per

Orders.	Average Strength, 4,602.		Deaths.				Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.		
	<b>I.—General Diseases.</b>								
	<i>Febrile Group.</i>								
	Eruptive Fevers { Small-pox	2	—	—	—	—	—	·37	
	{ Other	2	—	—	—	—	—	·27	
	Continued " { Enteric	93	24	—	24	5	1	19·46	
	{ Other	837	5	—	5	12	—	60·79	
	Yellow Fever	—	—	—	—	—	—	—	
	Paroxysmal Fevers	96	3	—	3	9	1	13·07	
	Cholera	—	—	—	—	—	—	—	
	Other Diseases	4	2	—	2	—	—	·21	
	Total	1,034	34	—	34	26	2	94·17	
	<i>Constitutional Group.</i>								
	Rheumatism	230	1	—	1	5	5	14·19	
	Primary Syphilis	172	—	—	—	—	—	12·88	
	Secondary "	102	—	—	—	—	—	7·81	
	Tubercular diseases	34	8	3	11	11	7	3·95	
	Scurvy and Purpura	1	—	—	—	—	—	·03	
	Other Diseases	7	—	—	—	2	—	·44	
	Total	546	9	3	12	18	12	39·30	
	<b>II.—Local Diseases.</b>								
	<i>Diseases of the—</i>								
1	Nervous System	60	3	—	3	21	13	6·41	
2	Eye	68	—	—	—	1	—	3·24	
3	Ear	30	—	—	—	—	2	·89	
4	Nose	4	—	—	—	—	—	·17	
5	Circulatory System	78	1	1	2	20	12	6·66	
6	Absorbent "	22	—	—	—	—	—	1·23	
7	Ductless glands	—	—	—	—	—	—	—	
8	Respiratory System	142	3	—	3	8	3	10·05	
9	Digestive "	579	3	1	4	8	2	24·00	
10	Urinary { Gonorrhœa	268	—	—	—	—	—	17·65	
	System { Sequelæ of Gonorrh.	41	—	—	—	—	1	2·99	
	{ Other diseases	45	—	—	—	5	1	3·31	
11	Generative System	63	—	—	—	—	—	3·54	
12	Organs of Locomotion	35	—	—	—	1	2	2·66	
13	Cellular Tissue	264	—	—	—	3	1	12·08	
14	Cutaneous System	388	—	—	—	1	—	16·71	
	III.—Debility	47	—	—	—	5	—	3·33	
	IV.—Poisons	22	3	—	3	—	6	·71	
	<b>V.—Injuries.</b>								
1	General	2	4	—	4	—	—	·34	
2	Local	499	3	—	3	7	—	21·90	
3	In action	—	—	—	—	—	—	—	
	No appreciable disease	12	—	—	—	—	—	·70	
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—	
	General total	4,249	63	5	68	124	57	272·04	
	Average of 10 years, 1875–84	—	—	—	—	—	—	—	

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1883.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
.4	—	—	—	.08	.1	.04	—	—	.01
.4	—	—	—	.06	3.4	—	—	—	.14
20.2	5.22	1.09	.22	4.23	15.8	3.36	.43	—	3.12
181.9	1.09	2.61	—	13.21	142.0	.11	.61	—	6.46
—	—	—	—	—	—	—	—	—	—
20.9	.65	1.95	.22	2.84	10.1	.32	.61	.29	1.03
—	—	—	—	—	.1	—	—	—	—
.9	.43	—	—	.04	4.9	.07	—	—	.26
224.7	7.39	5.65	.43	20.46	176.4	3.90	1.64	.29	11.02
50.0	.22	1.09	1.09	3.08	32.8	.07	1.64	.46	2.47
37.4	—	—	—	2.80	37.5	.04	—	—	3.23
22.2	—	—	—	1.70	12.8	—	.57	.32	1.04
7.4	2.39	2.39	1.52	.86	8.0	1.47	3.86	2.29	1.32
.2	—	—	—	.01	.2	.04	.04	.04	.05
1.5	—	.43	—	.09	2.5	.11	.22	.11	.80
118.7	2.61	3.91	2.61	8.54	93.8	1.72	6.33	3.22	8.41
13.0	.65	4.56	2.82	1.39	13.4	.46	3.72	.96	1.34
14.8	—	.22	—	.70	18.9	—	1.43	.93	1.20
6.5	—	—	.43	.19	10.6	—	1.36	1.07	.89
.9	—	—	—	.04	.6	—	—	—	.03
16.9	.43	4.34	2.61	1.45	16.5	.54	3.97	2.79	1.65
4.8	—	—	—	.27	4.4	—	—	—	.38
—	—	—	—	—	.2	—	—	—	.03
30.9	.65	1.74	.65	2.18	38.8	.71	1.89	.82	3.34
125.8	.87	1.74	.43	5.22	129.8	.54	1.61	.71	5.03
58.2	—	—	—	3.84	62.1	—	—	—	3.86
8.9	—	—	.22	.65	9.0	—	.11	.11	.60
9.8	—	1.09	.22	.72	10.7	.07	.18	.11	.53
13.7	—	—	—	.77	10.3	—	.03	.07	.71
7.6	—	.22	.43	.58	6.0	—	.75	.50	.63
57.4	—	.65	.22	2.63	29.6	—	.18	—	1.39
84.3	—	.22	—	3.63	75.5	—	.64	.07	4.06
10.2	—	1.09	1.30	.72	17.4	.04	3.40	1.22	1.80
4.8	.65	—	—	.15	5.9	.18	—	—	.14
.4	.87	—	—	.07	.9	.54	—	—	.07
108.4	.65	1.52	—	4.76	105.9	.75	.61	.61	4.82
—	—	—	—	—	—	—	—	—	—
2.6	—	—	—	.15	4.0	—	—	—	.13
—	—	—	—	—	—	—	—	—	—
923.3	14.77	26.94	12.38	59.11	840.7	9.44	27.85	13.48	52.05
856.2	9.84	29.38	15.81	49.41	—	—	—	—	—

will be given in future years.



ABSTRACT No. IIIA.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into MALTA FENCIBLE ARTILLERY TROOPS stationed at MALTA during the Year 1885,

Orders.	Average Strength, 353.		Admissions into Hospital.	Deaths.			Invalids.		Average Number Constantly Sick.
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	<b>I.—General Diseases.</b>								
	<i>Febrile Group.</i>								
	Eruptive Fevers	{ Small-pox —	—	—	—	—	—	—	—
		{ Others —	—	—	—	—	—	—	—
	Continued „	{ Enteric —	1	—	—	—	—	—	·15
		{ Others —	46	—	—	—	—	—	1·17
	Yellow Fever	—	—	—	—	—	—	—	—
	Paroxysmal Fevers	—	1	1	1	—	—	—	·03
	Cholera	—	—	—	—	—	—	—	—
	Other diseases	—	—	—	—	—	—	—	—
	Total	—	48	1	—	1	—	—	1·35
	<i>Constitutional Group.</i>								
	Rheumatism	—	24	—	—	—	—	—	·70
	Primary Syphilis	—	2	—	—	—	—	—	·31
	Secondary „	—	3	—	—	—	—	—	·12
	Tubercular diseases	—	2	—	—	—	—	—	·30
	Scurvy and Purpura	—	—	—	—	—	—	—	—
	Other diseases	—	—	—	—	—	—	—	—
	Total	—	31	—	—	—	—	—	1·43
	<b>II.—Local Diseases.</b>								
	<i>Diseases of the—</i>								
1	Nervous System	—	1	—	—	—	—	1	·17
2	Eye	—	14	—	—	—	—	—	·49
3	Ear	—	3	—	—	—	—	—	·04
4	Nose	—	1	—	—	—	—	—	—
5	Circulatory System	—	1	—	—	—	—	1	·04
6	Absorbent „	—	1	—	—	—	—	—	·18
7	Ductless Glands	—	—	—	—	—	—	—	—
8	Respiratory System	—	27	—	—	—	—	1	·79
9	Digestive „	—	49	—	—	—	—	—	1·30
10	Urinary { Gonorrhœa	—	11	—	—	—	—	—	·76
	System { Sequelæ of Gonorrh.	—	1	—	—	—	—	—	·03
	Other diseases	—	—	—	—	—	—	—	—
11	Generative System	—	1	—	—	—	—	—	·08
12	Organs of Locomotion	—	—	—	—	—	—	—	·02
18	Cellular Tissue	—	5	—	—	—	—	—	·10
14	Cutaneous System	—	33	—	—	—	—	—	·84
	III.—Debility	—	6	—	—	—	—	1	·43
	IV.—Poisons	—	—	—	—	—	—	—	—
	<b>V.—Injuries.</b>								
1	General	—	—	—	—	—	—	—	—
2	Local	—	57	—	—	—	—	—	1·34
8	In action	—	—	—	—	—	—	—	—
	No appreciable disease	—	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—	—
	General total	—	290	1	—	1	—	4	9·39
	Average of 10 years, 1875–84		—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the ROYAL with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
2·8	—	—	—	·42	2·0	—	—	—	·08
130·3	—	—	—	3·32	118·3	—	—	—	·06
2·8	2·83	—	—	·08	14·2	·98	—	—	·82
—	—	—	—	—	·4	—	—	—	—
135·9	2·83	—	—	3·82	135·9	·98	—	—	3·58
68·0	—	—	—	1·98	21·9	—	—	1·96	·99
5·7	—	—	—	·88	5·8	—	—	—	·39
8·5	—	—	—	·34	5·3	—	—	—	·45
5·7	—	—	—	·85	9·7	2·46	—	2·94	1·23
—	—	—	—	—	5·9	—	—	—	·30
87·9	—	—	—	4·05	48·6	2·46	—	4·90	3·36
2·8	—	—	2·83	·48	5·9	·98	—	2·94	·59
39·7	—	—	—	1·39	20·1	—	—	1·96	·38
8·5	—	—	—	·11	4·9	—	—	—	·11
2·8	—	—	—	—	—	—	—	—	—
2·8	—	—	2·83	·11	8·8	·98	—	4·40	·73
2·8	—	—	—	·51	2·9	—	—	—	·12
—	—	—	—	—	·5	—	—	—	·02
76·5	—	—	2·83	2·24	73·9	·48	—	·97	3·42
138·8	—	—	—	3·68	90·9	·48	—	1·95	2·62
31·2	—	—	—	2·16	28·9	—	—	—	1·90
2·8	—	—	—	·08	·9	—	—	—	·05
—	—	—	—	—	·9	—	—	—	·01
2·8	—	—	—	·23	6·9	—	—	—	·37
—	—	—	—	·06	3·4	—	—	·48	·26
14·2	—	—	—	·28	7·5	—	—	—	·37
93·5	—	—	—	2·38	64·7	—	—	·97	1·83
17·0	—	—	2·83	1·22	15·3	—	—	5·37	·81
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	·48	—	—	—
161·5	—	—	—	3·80	101·8	—	—	—	2·53
—	—	—	—	—	·9	—	—	—	·02
—	—	—	—	—	—	—	—	—	—
821·5	2·83	—	11·33	26·60	623·6	6·84	—	23·94	23·08
659·5	6·47	—	22·05	25·72	—	—	—	—	—

will be given in future years.

ABSTRACT No. IV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at CYPRUS during the Year 1885, with the Ratios per

Orders.	Average Strength, 852.		Admissions into Hospital.	Deaths.			Invalids.		Average Number Con- stantly Sick.
	Diseases.			In the Com- mand.	Of Inva- lids.	Total.	Number sent Home.	Number finally Dis- charged the Service.	
	<b>I.—General Diseases.</b>								
	<i>Febrile Group.</i>								
	Eruptive Fevers	{ Small-pox	—	—	—	—	—	—	—
		{ Other	—	—	—	—	—	—	—
	Continued „	{ Enteric	51	14	1	15	1	—	4·88
		{ Other	85	—	—	—	—	—	3·35
	Yellow Fever	—	—	—	—	—	—	—	—
	Paroxysmal Fevers	—	180	—	—	—	—	—	3·54
	Cholera	—	—	—	—	—	—	—	—
	Other diseases	—	2	—	—	—	—	—	·09
	Total	—	318	14	1	15	1	—	11·86
	<i>Constitutional Group.</i>								
	Rheumatism	—	7	—	—	—	—	—	·22
	Primary Syphilis	—	55	—	—	—	—	—	2·86
	Secondary „	—	34	—	—	—	—	—	1·99
	Tubercular diseases	—	1	—	—	—	—	—	·19
	Scurvy and Purpura	—	—	—	—	—	—	—	—
	Other diseases	—	—	—	—	—	—	—	—
	Total	—	97	—	—	—	—	—	5·26
	<b>II.—Local Diseases.</b>								
	<i>Diseases of the—</i>								
1	Nervous System	—	7	—	—	—	3	4	·71
2	Eye	—	13	—	—	—	—	—	·40
3	Ear	—	7	—	—	—	—	—	·28
4	Nose	—	2	—	—	—	—	—	·06
5	Circulatory System	—	4	2	—	2	1	—	·40
6	Absorbent „	—	7	—	—	—	—	—	·58
7	Ductless Glands	—	—	—	—	—	—	—	—
8	Respiratory System	—	26	—	—	—	—	—	1·28
9	Digestive „	—	160	1	—	1	1	1	5·25
10	Urinary { Gonorrhœa	—	30	—	—	—	—	—	1·54
	Sequelæ of Gonorrh.	—	19	—	—	—	—	—	·96
	Other diseases	—	6	—	—	—	—	—	·32
11	Generative System	—	14	—	—	—	—	—	·51
12	Organs of Locomotion	—	5	—	—	—	—	—	·12
13	Cellular Tissue	—	19	—	—	—	—	—	·69
14	Cutaneous System	—	54	—	—	—	—	—	1·99
	III.—Debility	—	53	—	—	—	1	—	1·87
	IV.—Poisons	—	5	—	—	—	—	—	·13
	V.—Injuries.	—	—	—	—	—	—	—	—
1	General	—	—	—	—	—	—	—	—
2	Local	—	68	—	—	—	—	—	2·82
3	In action	—	—	—	—	—	—	—	—
	No appreciable disease	—	4	—	—	—	—	—	·12
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—	—
	General Total	—	918	17	1	18	7	5	37·15
	Average of 7 years, 1878–84	—	—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
59·8	17·61	1·17	—	5·73	·3	—	—	—	·01
99·8	—	—	—	3·93	8·1	1·29	·32	—	1·29
—	—	—	—	—	85·3	—	—	—	1·96
211·3	—	—	—	4·15	—	—	—	—	—
—	—	—	—	—	201·3	2·25	4·51	1·29	5·95
2·3	—	—	—	·11	—	—	—	—	—
373·2	17·61	1·17	—	13·92	295·0	3·54	4·83	1·29	9·21
8·2	—	—	—	·26	23·8	—	1·29	·32	1·42
64·6	—	—	—	3·36	72·1	—	—	—	5·31
39·9	—	—	—	2·33	37·4	—	·97	·32	2·70
1·2	—	—	—	·22	1·9	·32	·64	1·93	·22
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·7	—	·32	—	·16
113·9	—	—	—	6·17	135·9	·32	3·22	2·58	9·81
8·2	—	3·52	4·70	·83	8·7	·64	2·58	·64	·56
15·3	—	—	—	·47	20·3	—	1·29	·64	·76
8·2	—	—	—	·33	3·9	—	—	—	·21
2·3	—	—	—	·07	—	—	—	—	—
4·7	2·35	1·17	—	·47	7·1	·64	1·93	2·25	·71
8·2	—	—	—	·68	4·5	—	—	—	·37
—	—	—	—	—	—	—	—	—	—
30·5	—	—	—	1·51	25·8	·97	1·29	·97	1·22
187·8	1·17	1·17	1·17	6·16	137·2	2·25	2·58	1·29	4·52
35·2	—	—	—	1·81	72·8	—	—	—	4·19
22·3	—	—	—	1·13	10·6	—	—	—	·76
7·0	—	—	—	·37	4·2	·32	—	·32	·15
16·4	—	—	—	·60	9·0	—	—	—	·47
5·9	—	—	—	·14	5·2	—	·32	·32	·23
22·3	—	—	—	·81	18·0	—	·64	·32	·90
63·4	—	—	—	2·34	63·4	—	·97	—	2·41
62·2	—	1·17	—	2·19	12·9	—	4·19	4·51	1·16
5·9	—	—	—	·15	6·1	1·29	—	—	·14
—	—	—	—	—	·6	·32	—	—	·03
79·8	—	—	—	3·31	95·7	·64	·97	1·29	3·76
—	—	—	—	—	—	—	—	—	—
4·7	—	—	—	·14	·6	—	—	—	·03
—	—	—	—	—	—	—	—	—	—
1077·4	21·13	8·21	5·87	43·60	937·5	10·95	24·80	16·42	41·60
1710·9	17·50	53·01	17·50	81·77	—	—	—	—	—

will be given in future years.

**ABSTRACT No. V.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into**  
**stationed in CANADA during the Year 1885, with the Ratios per**

Orders.	Average Strength, 1,273.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		<b>I.—General Diseases.</b>							
		<i>Febrile Group.</i>							
		Eruptive Fevers { Small-pox	—	—	—	—	—	—	—
		Other - 1	1	—	—	—	—	—	·09
		Continued „ { Enteric - 1	1	1	—	1	—	—	·04
		Other - 7	7	—	—	—	—	—	·14
		Yellow Fever - - -	—	—	—	—	—	—	—
		Paroxysmal Fevers - -	—	—	—	—	—	—	—
		Cholera - - -	—	—	—	—	—	—	—
		Other Diseases - - -	3	—	—	—	—	—	·19
		Total - - -	12	1	—	1	—	—	·46
		<i>Constitutional Group.</i>							
		Rheumatism - - -	52	—	—	—	2	3	3·58
		Primary Syphilis - -	93	—	—	—	—	—	7·17
		Secondary „ - - -	67	—	—	—	1	1	4·07
		Tubercular diseases -	16	1	—	1	5	5	1·64
		Scurvy and Purpura -	—	—	—	—	—	—	—
		Other Diseases - - -	—	—	—	—	—	—	—
		Total - - -	228	1	—	1	8	9	16·46
		<b>II.—Local Diseases.</b>							
		Diseases of the - - -							
1		Nervous System - - -	17	—	—	—	6	8	1·61
2		Eye - - -	15	—	—	—	2	1	1·66
3		Ear - - -	9	—	—	—	1	3	·50
4		Nose - - -	4	—	—	—	1	—	·36
5		Circulatory System -	10	—	—	—	—	1	·29
6		Absorbent „ - - -	14	—	—	—	1	—	1·09
7		Ductless Glands - -	—	—	—	—	—	—	—
8		Respiratory System -	89	4	—	4	9	7	7·35
9		Digestive „ - - -	122	1	—	1	—	—	3·67
10		Urinary { Gonorrhœa - - -	116	—	—	—	—	—	7·36
		System { Sequelæ of Gonorr. -	12	—	—	—	—	—	·78
		Other diseases - - -	24	—	—	—	—	2	·95
11		Generative System -	11	—	—	—	—	—	·28
12		Organs of Locomotion -	5	—	—	—	—	2	·14
13		Cellular Tissue - - -	28	—	—	—	—	—	1·26
14		Cutaneous System - -	60	—	—	—	—	—	3·76
		III.—Debility - - -	12	—	—	—	6	1	1·47
		IV.—Poisons - - -	10	1	—	1	—	—	·29
		V.—Injuries.							
1		General - - -	—	—	—	—	—	—	—
2		Local - - -	110	2	—	2	—	1	3·44
3		In action - - -	—	—	—	—	—	—	—
		No appreciable disease -	2	—	—	—	—	—	·01
		Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
		General total - - -	910	10	—	10	34	35	52·19
		Average of 10 years, 1875-84	—	—	—	—	—	—	—

\* The average ratios for 10 years

**HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS  
1,000 of the Strength, and the Average Ratios for 10 Years.\***

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
·8	—	—	—	·07	3·1	—	—	—	·22
·8	·79	—	—	·03	1·0	—	—	—	·10
5·5	—	—	—	·11	7·2	·10	—	—	·29
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	46·4	—	2·79	—	1·24
2·3	—	—	—	·15	3·8	·10	—	—	·18
9·4	·79	—	—	·36	61·5	·20	2·79	—	2·03
40·8	—	1·57	2·36	2·81	45·8	·10	1·90	·60	3·65
73·1	—	—	—	5·63	80·2	—	—	—	6·45
52·6	—	·79	·79	3·20	42·4	—	1·10	1·20	3·02
12·6	·79	3·92	3·92	1·29	8·7	1·50	3·69	4·09	1·18
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·4	·10	·50	·20	·11
179·1	·79	6·28	7·06	12·93	178·5	1·70	7·19	6·09	14·44
13·4	—	4·71	6·28	1·27	9·1	·10	2·60	·90	·94
11·8	—	1·57	·79	1·31	14·4	—	1·00	1·50	·90
7·1	—	·79	2·36	·39	5·9	—	·50	·80	·33
3·1	—	·79	—	·28	·8	—	·10	·10	·04
7·9	—	—	·79	·23	15·8	1·00	3·49	4·49	1·09
11·0	—	·79	—	·86	20·6	—	—	·10	1·76
—	—	—	—	—	—	—	—	—	—
69·9	3·14	7·07	5·50	5·77	62·8	·80	3·00	·90	3·05
95·8	·79	—	—	2·88	111·1	·20	·80	1·10	3·13
91·1	—	—	—	5·78	88·8	—	—	—	4·83
9·4	—	—	—	·61	11·0	—	—	·20	·61
18·9	—	—	1·57	·75	14·1	·20	1·60	1·10	·70
8·6	—	—	—	·22	10·2	—	·20	·40	·56
3·9	—	—	1·57	·11	4·9	—	1·60	1·10	·42
22·0	—	—	—	·99	12·3	—	·10	—	·52
47·1	—	—	—	2·17	44·0	—	·10	·10	1·69
9·4	—	4·71	·79	1·15	7·9	—	2·40	1·70	·64
7·9	·79	—	—	·23	19·4	·30	—	—	·65
—	—	—	—	—	—	·60	—	—	—
86·4	1·57	—	·79	2·70	105·5	·20	·90	·60	3·74
—	—	—	—	—	—	—	—	—	—
1·6	—	—	—	·01	1·9	—	—	—	·04
—	—	—	—	—	—	—	—	—	—
714·8	7·86	26·71	27·50	41·00	800·5	5·30	28·37	21·18	42·11
720·7	5·69	28·99	17·06	37·37	—	—	—	—	—

will be given in future years.

ABSTRACT No. VI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed at BERMUDA during the Year 1885, with the Ratios

Orders.	Average Strength, 1,385.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
I. General Diseases.									
Febrile Group.									
		Eruptive Fevers { Small-pox	—	—	—	—	—	—	—
		{ Other	—	—	—	—	—	—	—
		Continued „ { Enteric	29	10	—	10	—	—	4.12
		{ Other	28	—	—	—	—	—	1.53
		Yellow Fever	—	—	—	—	—	—	—
		Paroxysmal Fevers	—	—	—	—	—	—	—
		Cholera	—	—	—	—	—	—	—
		Other diseases	—	—	—	—	—	—	—
		Total	57	10	—	10	—	—	5.65
Constitutional Group.									
		Rheumatism	34	—	—	—	3	—	2.32
		Primary Syphilis	36	—	—	—	—	—	2.48
		Secondary „	37	—	—	—	2	—	2.00
		Tubercular diseases	11	3	—	3	8	2	3.03
		Scurvy and Purpura	—	—	—	—	—	—	—
		Other diseases	2	—	—	—	1	1	.35
		Total	120	3	—	3	14	3	10.18
II. Local Diseases.									
Diseases of the—									
1		Nervous System	8	1	—	1	3	1	1.17
2		Eye	6	—	—	—	—	—	.58
3		Ear	4	—	—	—	1	—	.20
4		Nose	—	—	—	—	—	—	—
5		Circulatory System	10	—	—	—	1	—	1.05
6		Absorbent „	28	—	—	—	—	—	3.04
7		Ductless Glands	—	—	—	—	—	—	—
8		Respiratory System	46	—	—	—	1	—	1.82
9		Digestive „	136	2	—	2	6	—	3.97
10		Urinary { Gonorrhœa	16	—	—	—	—	—	.99
		System { Sequelæ of Gonorr.	4	—	—	—	—	—	.21
		{ Other diseases	8	—	—	—	1	—	.33
11		Generative System	3	—	—	—	—	—	.13
12		Organs of Locomotion	7	—	—	—	1	—	.97
13		Cellular Tissue	26	—	—	—	—	—	.47
14		Cutaneous System	45	—	—	—	—	—	1.31
		III.—Debility	26	—	—	—	5	4	1.66
		IV.—Poisons	16	—	—	—	—	—	.46
		V.—Injuries.							
1		General	1	—	—	—	—	—	.12
2		Local	112	2	—	2	—	—	4.36
3		In action	—	—	—	—	—	—	—
		No appreciable disease	5	—	—	—	—	—	.16
		Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
		General Total	684	18	—	18	33	8	38.83
		Average of 10 years, 1875–84	—	—	—	—	—	—	—

The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·4	—	—	—	·05
20·9	7·22	—	—	2·98	14·6	2·61	—	—	1·61
20·2	—	—	—	1·10	31·3	—	—	—	1·28
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·7	—	·10	—	·15
—	—	—	—	—	·1	·10	—	—	—
—	—	—	—	—	1·5	—	—	—	·11
41·1	7·22	—	—	4·08	49·6	2·71	·10	—	3·20
24·6	—	2·17	—	1·68	26·5	—	·90	·61	1·62
26·0	—	—	—	1·79	39·4	—	—	—	3·25
26·7	—	1·44	—	1·44	12·9	—	·30	·20	·97
7·9	2·17	5·78	1·44	2·19	7·4	1·11	2·92	2·21	1·50
—	—	—	—	—	·1	—	—	—	·01
1·4	—	·72	·72	·25	1·6	·10	·20	·10	·11
86·6	2·17	10·11	2·16	7·35	87·9	1·21	4·32	3·12	7·46
5·8	·72	2·17	·72	·84	9·7	·70	1·21	·30	·90
4·3	—	—	—	·42	10·9	—	·60	·70	·65
2·9	—	·72	—	·14	7·3	—	·40	·40	·40
—	—	—	—	—	·3	—	·10	—	·02
7·2	—	·72	—	·76	11·6	·20	2·11	1·71	1·24
20·2	—	—	—	2·19	24·5	—	·10	—	2·94
—	—	—	—	—	·1	—	—	—	·01
33·2	—	·72	—	1·31	34·4	·20	·61	·30	1·86
98·2	1·44	4·33	—	2·87	129·7	·50	·81	·60	3·78
11·6	—	—	—	·72	23·1	—	—	—	1·35
2·9	—	—	—	·15	4·0	—	·20	—	·39
5·8	—	·72	—	·24	7·9	—	·50	·40	·51
2·2	—	—	—	·09	8·4	—	·10	·10	·43
5·1	—	·72	—	·70	4·7	·10	·40	·40	·29
18·8	—	—	—	·34	25·0	—	·10	—	·87
32·5	—	—	—	·95	61·0	—	·40	·40	2·41
18·8	—	3·62	2·89	1·20	15·7	—	1·51	1·51	1·30
11·5	—	—	—	·33	9·5	·51	—	—	·37
·7	—	—	—	·09	—	·91	—	—	—
80·9	1·44	—	—	3·15	118·6	·40	·60	·61	4·53
—	—	—	—	—	—	—	—	—	—
3·6	—	—	—	·12	1·3	—	—	—	·06
—	—	—	—	—	—	·20	—	—	—
493·9	13·00	23·83	5·77	28·04	645·2	7·64	14·17	10·55	34·97
635·5	7·52	17·37	10·41	34·45	—	—	—	—	—

will be given in future years.



ABSTRACT No. VII.—TABLE showing the AVERAGE STRENGTH, the ADMISSIONS into TROOPS stationed in the WEST INDIES, during the Year 1885, with the

Orders.	Average Strength, 900.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number Constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		<b>I.—General Diseases.</b>							
		<i>Febrile Group.</i>							
		Eruptive Fevers { Small-pox	—	—	—	—	—	—	—
		Other -	1	—	—	—	—	—	·03
		Continued " { Enteric -	3	2	2	—	—	—	·20
		Other -	86	—	—	—	—	—	2·28
		Yellow Fever -	5	2	2	—	—	—	·15
		Paroxysmal Fevers -	25	—	—	—	—	—	1·26
		Cholera -	—	—	—	—	—	—	—
		Other Diseases -	—	—	—	—	—	—	—
		Total -	120	4	—	4	—	—	3·92
		<i>Constitutional Group.</i>							
		Rheumatism -	21	—	—	—	—	—	·86
		Primary Syphilis -	59	—	—	—	—	—	4·45
		Secondary " -	47	—	—	—	1	1	3·17
		Tubercular Diseases -	7	1	1	4	—	—	1·33
		Scurvy and Purpura -	—	—	—	—	—	—	—
		Other Diseases -	—	—	—	—	—	—	—
		Total -	134	1	—	1	5	1	9·81
		<b>II.—Local Diseases.</b>							
		<i>Diseases of the—</i>							
1		Nervous System -	15	2	—	2	3	2	1·41
2		Eye -	14	—	—	—	—	—	·54
3		Ear -	17	—	—	—	1	—	1·09
4		Nose -	—	—	—	—	—	—	—
5		Circulatory System -	21	—	—	—	2	—	·91
6		Absorbent " -	10	—	—	—	—	—	1·50
7		Ductless Glands -	1	—	—	—	1	—	·15
8		Respiratory System -	19	—	—	—	1	1	·82
9		Digestive " -	101	—	—	—	—	—	2·44
		Urinary { Gonorrhœa -	80	—	—	—	—	—	4·22
10		System { Sequelæ of Gonorrh. -	18	—	—	—	—	—	1·16
		Other Diseases -	5	—	—	—	—	1	·21
11		Generative System -	8	—	—	—	—	—	·31
12		Organs of Locomotion -	6	—	—	—	—	—	·53
13		Cellular Tissue -	28	—	—	—	—	—	·84
14		Cutaneous System -	81	—	—	—	—	—	3·27
		<b>III.—Debility</b> -	19	—	—	—	4	1	1·32
		<b>IV.—Poisons</b> -	7	—	—	—	—	—	·15
		<b>V.—Injuries.</b>							
1		General -	—	—	—	—	—	—	—
2		Local -	122	—	—	—	—	—	4·12
3		In action -	—	—	—	—	—	—	—
		No appreciable disease -	4	—	—	—	—	—	·05
		Cause unknown (refers to deaths only). -	—	—	—	—	—	—	—
		General total -	830	7	—	7	17	6	38·77
		Average for 10 years, 1875–84	—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED, and CONSTANTLY SICK among the WHITE  
 Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
1·1	—	—	—	·03	·4	—	—	—	·02
8·3	2·22	—	—	·22	4·0	1·32	—	—	·35
95·6	—	—	—	2·53	135·7	—	3·02	—	4·53
5·5	2·22	—	—	·17	12·9	8·12	—	—	·33
27·8	—	—	—	1·40	41·5	3·02	1·13	·19	1·93
—	—	—	—	—	·2	—	—	—	—
—	—	—	—	—	1·3	—	—	—	·06
133·3	4·44	—	—	4·35	196·0	12·46	4·15	·19	7·22
23·3	—	—	—	·96	37·2	—	·75	94	1·88
65·6	—	—	—	4·94	51·3	—	—	—	3·74
52·2	—	1·11	1·11	3·52	15·3	—	·57	—	1·28
7·8	1·11	4·44	—	1·48	7·4	·94	4·53	2·64	1·82
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·9	—	—	—	·07
148·9	1·11	5·55	1·11	10·90	112·1	·94	5·85	3·58	8·79
16·7	2·22	3·33	2·22	1·57	16·2	·57	5·28	2·64	1·69
15·6	—	—	—	·60	10·0	—	1·32	1·13	·62
18·9	—	1·11	—	1·21	11·7	—	·57	1·13	·51
—	—	—	—	—	·2	—	—	—	—
23·3	—	2·22	—	1·01	14·7	·75	3·77	2·45	1·58
11·1	—	—	—	1·67	19·4	—	—	—	1·75
1·1	—	—	—	·17	—	—	—	—	—
21·1	—	1·11	1·11	·91	23·8	1·13	·57	·76	1·60
112·2	—	—	—	2·71	119·7	1·51	1·51	·94	3·90
88·9	—	—	—	4·69	60·8	—	—	—	3·10
20·0	—	—	—	1·29	12·9	—	·19	—	·94
5·5	—	—	1·11	·23	11·9	·19	·19	—	·46
8·9	—	—	—	·34	16·4	—	—	·38	·64
6·7	—	—	—	·59	8·1	—	1·32	·38	·85
31·1	—	—	—	·93	20·0	—	—	—	·73
90·0	—	—	—	3·63	62·7	—	·38	·38	2·20
21·1	—	4·44	1·11	1·47	25·9	—	8·30	2·08	1·88
7·8	—	—	—	·17	7·7	·38	—	—	·19
—	—	—	—	—	·2	·88	·19	—	·07
135·6	—	—	—	4·58	124·0	1·13	·75	·76	4·34
—	—	—	—	—	—	—	—	—	—
4·4	—	—	—	·06	·6	—	—	—	·07
—	—	—	—	—	—	—	—	—	—
922·2	7·77	18·88	6·66	43·08	875·0	19·44	34·34	16·80	43·13
885·0	15·36	26·82	15·46	44·54	—	—	—	—	—

will be given in future years.

o 24039.

O

ABSTRACT No. VIII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed in the WEST INDIES, during the year 1885, with the

Orders.	Average Strength, 1,186.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		<b>I.—General Diseases.</b>							
		<i>Febrile Group.</i>							
		Eruptive Fevers { Small-pox	2	—	—	—	—	—	·09
		Other	2	—	—	—	—	—	·09
		Continued „ { Enteric	—	—	—	—	—	—	—
		Other	83	—	—	—	—	—	2·56
		Yellow Fever	—	—	—	—	—	—	·05
		Paroxysmal Fevers	67	1	—	1	—	—	1·43
		Cholera	—	—	—	—	—	—	—
		Other diseases	22	—	—	—	—	—	·54
		Total	176	1	—	1	—	—	4·76
		<i>Constitutional Group.</i>							
		Rheumatism	55	—	—	—	—	—	2·43
		Primary Syphilis	198	—	—	—	—	—	17·64
		Secondary „	24	—	—	—	—	2	2·83
		Tubercular Diseases	3	3	—	3	—	1	·86
		Scurvy and Purpura	—	—	—	—	—	—	—
		Other diseases	—	—	—	—	—	—	—
		Total	280	3	—	3	—	3	23·76
		<b>II. Local Diseases.</b>							
		<i>Diseases of the—</i>							
1		Nervous System	15	—	—	—	—	3	1·23
2		Eye	31	—	—	—	—	4	2·50
3		Ear	2	—	—	—	—	—	·05
4		Nose	—	—	—	—	—	—	—
5		Circulatory System	13	3	—	3	—	4	3·12
6		Absorbent „	31	—	—	—	—	1	2·92
7		Ductless Glands	—	—	—	—	—	—	—
8		Respiratory System	68	4	—	4	—	3	4·29
9		Digestive „	97	3	—	3	—	1	3·70
10		Urinary { Gonorrhœa	173	—	—	—	—	—	8·66
		System { Sequelæ of Gonorr.	16	—	—	—	—	—	·86
		Other diseases	4	—	—	—	—	—	·28
11		Generative System	24	—	—	—	—	1	1·93
12		Organs of Locomotion	18	—	—	—	—	1	2·22
13		Cellular Tissue	36	1	—	1	—	1	2·37
14		Cutaneous System	50	—	—	—	—	2	3·17
		III.—Debility	11	—	—	—	—	2	1·83
		IV.—Poisons	2	1	—	1	—	—	·05
		V.—Injuries.							
1		General	—	2	—	2	—	—	—
2		Local	113	—	—	—	—	1	3·38
3		In action	—	—	—	—	—	—	—
		No appreciable disease	6	—	—	—	—	—	·33
		Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
		General Total	1,166	18	—	18	—	27	71·41
		Average of 10 years, 1875–84	—	—	—	—	—	—	—

\* The average ration for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the BLACK  
Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000, from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
1·7	—	—	—	·07	—	—	—	—	—
1·7	—	—	—	·07	9·3	—	—	—	·35
—	—	—	—	—	·1	—	—	—	—
70·0	—	—	—	2·16	57·9	—	—	—	1·95
—	—	—	—	·04	·1	·15	—	—	—
56·5	·84	—	—	1·21	133·5	1·83	—	·15	3·67
18·5	—	—	—	·46	—	—	—	—	—
—	—	—	—	—	4·3	—	—	—	·07
148·4	·84	—	—	4·01	205·2	1·98	—	·15	6·04
46·4	—	—	—	2·05	66·7	—	—	4·26	3·80
167·0	—	—	—	14·87	129·9	—	—	—	10·02
20·2	—	—	1·69	2·39	25·9	·30	—	5·02	3·12
2·5	2·53	—	·84	·72	12·0	4·57	—	6·55	1·78
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	2·1	·15	—	·46	·17
336·1	2·53	—	2·53	20·03	236·6	5·02	—	16·29	18·89
12·6	—	—	2·53	1·04	16·4	·46	—	4·57	1·52
26·1	—	—	3·37	2·11	17·7	—	—	·61	1·01
1·7	—	—	—	·04	2·1	—	—	—	·14
—	—	—	—	—	·1	—	—	—	—
11·0	2·53	—	3·37	2·63	18·8	2·43	—	4·57	1·53
26·1	—	—	·84	2·46	25·9	—	—	·15	2·07
—	—	—	—	—	—	—	—	—	—
57·3	3·37	—	2·53	3·62	55·3	1·37	—	1·52	3·71
81·8	2·53	—	·84	3·12	·91·7	2·18	—	1·06	4·58
145·9	—	—	—	7·30	123·5	—	—	—	7·04
13·5	—	—	—	·73	21·6	—	—	·15	1·53
3·4	—	—	—	·24	6·8	·61	—	·46	·29
20·2	—	—	·84	1·63	25·0	—	—	1·22	1·54
15·2	—	—	·84	1·87	11·0	—	—	1·98	·84
30·3	·84	—	·84	2·00	25·4	—	—	·15	1·20
42·2	—	—	1·69	2·67	74·9	—	—	·46	3·34
9·3	—	—	1·69	1·54	12·0	·30	—	5·33	1·19
1·7	·84	—	—	·04	·1	—	—	—	—
—	1·69	—	—	—	—	·46	—	—	—
95·3	—	—	·84	2·85	92·3	·30	—	1·52	3·57
—	—	—	—	—	—	—	—	—	—
5·0	—	—	—	·28	1·7	—	—	—	0·9
—	—	—	—	—	—	—	—	—	—
983·1	15·17	—	22·76	60·21	1063·6	15·06	—	40·19	60·17
1077·5	15·60	—	40·20	52·28	—	—	—	—	—

will be given in future years.

ABSTRACT No. IX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at WEST AFRICA during the year 1885, with the

Orders.	Average Strength, 422.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent to West Indies.	Number finally Discharged the Service.	
	<b>I.—General Diseases.</b>							
	<i>Febrile Group.</i>							
	Eruptive Fevers { Small-pox	—	—	—	—	—	—	—
	Other	—	—	—	—	—	—	—
	Continued „ { Enteric	—	—	—	—	—	—	—
	Other	—	—	—	—	—	—	—
	Yellow Fever	—	—	—	—	—	—	—
	Paroxysmal Fevers	111	1	—	1	—	—	2·69
	Cholera	—	—	—	—	—	—	—
	Other Diseases	1	—	—	—	—	—	·09
	Total	112	1	—	1	—	—	2·78
	<i>Constitutional Group.</i>							
	Rheumatism	31	—	—	—	3	—	1·30
	Primary Syphilis	41	—	—	—	—	—	4·09
	Secondary „	4	—	—	—	1	1	·69
	Tubercular diseases	4	2	—	2	3	1	·67
	Scurvy and Purpura	—	—	—	—	—	—	—
	Other Diseases	3	1	—	1	—	—	·10
	Total	83	3	—	3	7	2	6·85
	<b>II.—Local Diseases.</b>							
	<i>Diseases of the—</i>							
1	Nervous System	5	—	—	—	1	2	·26
2	Eye	12	—	—	—	1	—	·52
3	Ear	1	—	—	—	—	—	·01
4	Nose	—	—	—	—	—	—	—
5	Circulatory System	12	1	—	1	3	2	·53
6	Absorbent „	9	—	—	—	1	—	1·82
7	Ductless glands	1	—	—	—	—	—	·25
8	Respiratory System	33	1	—	1	—	—	1·49
9	Digestive „	52	—	—	—	3	1	1·61
10	Urinary { Gonorrhœa	41	—	—	—	—	—	2·24
	System { Sequelæ of Gonorr.	10	—	—	—	—	—	1·13
	Other diseases	2	—	—	—	3	1	·17
11	Generative System	15	—	—	—	—	—	1·09
12	Organs of Locomotion	7	—	—	—	3	4	·61
13	Cellular Tissue	14	—	—	—	—	—	·68
14	Cutaneous System	80	—	—	—	1	1	4·75
	III.—Debility	1	—	—	—	2	3	·03
	IV.—Poisons	1	—	—	—	—	—	·01
	<b>V.—Injuries.</b>							
1	General	—	—	—	—	—	—	—
2	Local	62	—	—	—	—	—	2·20
3	In action	—	—	—	—	—	—	—
	No appreciable disease	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	General total	553	6	—	6	25	16	29·13
	Average of 10 years, 1875–84	—	—	—	—	—	—	—

\* The average ratios for 10 years

**HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS**  
**Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.\***

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	·3	—	—	—	·02
—	—	—	—	—	13·4	—	—	—	·53
—	—	—	—	—	·3	·29	—	—	·02
—	—	—	—	—	1·5	—	—	—	·05
—	—	—	—	—	·5	·58	—	—	—
263·0	2·37	—	—	6·38	477·0	2·91	—	—	13·67
—	—	—	—	—	—	—	—	—	—
2·4	—	—	—	·21	7·9	—	—	—	·37
265·4	2·37	—	—	6·59	500·9	3·79	—	—	14·66
73·4	—	7·11	—	3·08	74·3	—	—	·87	4·25
97·2	—	—	—	9·69	105·7	—	—	—	6·38
9·5	—	2·37	2·37	1·63	38·7	—	—	3·20	2·32
9·5	4·74	7·11	2·37	1·59	21·5	8·15	—	2·04	2·40
—	—	—	—	—	—	—	—	—	—
7·1	2·37	—	—	·24	1·5	·29	—	—	·08
196·7	7·11	16·59	4·74	16·23	241·7	8·44	—	6·12	15·43
11·8	—	2·37	4·74	·62	21·3	·87	—	·58	1·18
28·4	—	2·37	—	1·23	23·6	—	—	1·46	1·43
2·4	—	—	—	·02	6·1	—	—	—	·20
—	—	—	—	—	·2	—	—	—	—
28·4	2·37	7·11	4·74	1·26	25·0	1·46	—	2·91	2·12
21·3	—	2·37	—	4·31	17·8	—	—	—	·94
2·4	—	—	—	·59	—	—	—	—	—
78·2	2·37	—	—	3·53	70·8	2·33	—	1·45	3·85
123·2	—	7·11	2·37	3·82	135·7	2·91	—	·87	5·40
97·2	—	—	—	5·55	140·4	—	—	—	5·87
23·7	—	—	—	2·68	20·7	—	—	—	1·47
4·7	—	7·11	2·37	·40	7·0	·87	—	—	·33
35·5	—	—	—	2·58	16·9	—	—	—	·75
16·6	—	7·11	9·48	1·45	18·0	—	—	—	1·22
33·2	—	—	—	1·61	30·9	—	—	—	1·04
189·6	—	2·37	2·37	11·26	116·2	—	—	—	4·88
2·4	—	4·74	7·11	·07	9·0	—	—	—	·47
2·4	—	—	—	·02	1·5	·29	—	—	·03
—	—	—	—	—	·2	·29	—	—	·01
146·9	—	—	—	5·21	106·1	—	—	·58	3·30
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·7	—	—	—	·03
—	—	—	—	—	—	—	—	—	—
1310·4	14·22	59·24	37·91	69·03	1511·7	21·26	—	13·98	64·11
1485·8	19·28	—	8·49	63·16	—	—	—	—	—

will be given in future years.

ABSTRACT No. X.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at the CAPE OF GOOD HOPE and ST. HELENA during the year 1885,

Orders.	Average Strength, 3,939.		Admis- sions into Hospital.	Deaths.			Invalids.		Average Number con- stantly Sick.
	Diseases.			In the Com- mand.	Of Inva- lids.	Total.	Number sent Home.	Number finally Dis- charged the Service.	
I. General Diseases.									
Febrile Group.									
Eruptive Fevers { Small-pox			—	—	—	—	—	—	—
Continued „ { Other			29	9	—	9	—	—	5.54
Yellow Fever			181	—	—	—	—	—	7.20
Paroxysmal Fevers			—	—	—	—	—	—	—
Cholera			173	—	—	—	—	—	6.48
Other Diseases			1	—	—	—	—	—	.02
			6	1	—	1	—	—	.39
Total			390	10	—	10	—	—	19.63
Constitutional Group.									
Rheumatism			162	—	—	—	15	5	10.73
Primary Syphilis			588	—	—	—	—	—	41.48
Secondary „			195	—	—	—	14	2	17.06
Tubercular Diseases			14	1	1	2	9	7	1.40
Scurvy and Purpura			4	—	—	—	—	—	.13
Other Diseases			2	—	—	—	2	—	.21
Total			965	1	1	2	40	14	71.01
II. Local Diseases.									
Diseases of the—									
1	Nervous System		34	4	—	4	5	5	3.04
2	Eye		53	—	—	—	9	5	3.48
3	Ear		17	—	—	—	6	6	1.07
4	Nose		—	—	—	—	1	1	.12
5	Circulatory System		51	3	—	3	21	22	4.32
6	Absorbent „		99	—	—	—	1	1	6.50
7	Ductless Glands		—	—	—	—	—	—	—
8	Respiratory System		118	4	—	4	5	4	7.15
9	Digestive „		384	5	—	5	11	5	15.23
10	Urinary { Gonorrhœa		414	—	—	—	—	—	24.48
	System { Sequelæ of Gonorr.		36	—	—	—	—	—	8.20
	Other diseases		47	1	—	1	1	1	2.75
11	Generative System		42	—	—	—	2	1	2.09
12	Organs of Locomotion		41	—	—	—	10	5	3.27
13	Cellular Tissue		73	—	—	—	1	1	3.95
14	Cutaneous System		211	—	—	—	—	1	8.71
	III. Debility		122	—	—	—	37	8	7.80
	IV. Poisons		6	—	—	—	—	—	.21
	V. Injuries.								
1	General		1	2	—	2	—	—	—
2	Local		362	4	—	4	8	5	17.08
3	In action		—	—	—	—	—	—	—
	No appreciable disease		6	—	—	—	—	—	.32
	Causes unknown (refers to deaths only).		—	—	—	—	—	—	—
	General total		3,472	34	1	35	158	85	205.41
	Average of 10 years, 1875-84		—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
7·4	2·29	—	—	1·41	41·7	9·02	—	—	·13
45·9	—	—	—	1·83	92·2	·59	—	—	8·86
43·9	—	—	—	1·65	46·0	·72	3·93	·08	2·10
·3	—	—	—	—	—	—	—	—	—
1·5	·25	—	—	·10	2·7	·13	·08	—	·17
99·0	2·54	—	—	4·99	183·2	10·46	11·63	·08	11·26
41·1	—	3·81	1·27	2·72	44·8	—	6·10	1·42	2·86
149·3	—	—	—	10·53	44·7	—	—	—	4·00
49·5	—	3·55	·51	4·33	19·4	·02	1·60	·44	1·59
3·6	·51	2·29	1·77	·36	3·4	·70	1·73	1·40	·34
1·0	—	—	—	·03	·9	—	·08	—	·05
·5	—	·51	—	·05	2·1	·21	·49	·15	·20
245·0	·51	10·16	3·55	18·02	115·3	·93	10·00	3·41	9·04
8·6	1·02	1·27	1·27	·77	11·4	·65	3·07	·93	·92
18·5	—	2·29	1·27	·88	11·0	—	1·19	·98	·73
4·3	—	1·53	1·53	·27	4·6	—	·75	·67	·33
—	—	·25	·25	·03	·2	·02	—	—	·01
12·9	·76	5·33	5·59	1·10	18·1	·62	8·04	4·37	1·64
25·1	—	·25	·25	1·65	11·8	—	·21	·10	·90
—	—	—	—	—	—	—	—	·02	—
30·0	1·02	1·27	1·02	1·82	32·9	1·11	1·99	·98	2·23
97·5	1·27	2·79	1·27	3·87	165·1	3·80	10·36	2·43	9·35
105·1	—	—	—	6·21	31·2	—	—	—	2·29
9·1	—	—	—	·81	6·1	—	·26	·08	·42
11·9	·25	·25	·25	·70	4·9	·21	·67	·28	·29
10·7	—	·51	·25	·53	7·5	—	·41	·26	·50
10·4	—	2·54	1·27	·83	5·7	·10	1·32	·93	·46
18·5	—	·25	·25	1·00	17·7	—	·28	·16	·95
53·6	—	—	·25	2·21	51·0	—	·52	·21	2·82
31·0	—	9·39	2·03	1·98	35·7	·13	12·22	2·48	2·49
1·5	—	—	—	·05	3·1	·49	—	—	·15
·3	·51	—	—	—	·6	1·42	—	—	—
91·9	1·02	2·03	1·27	4·34	77·6	·52	2·04	1·60	3·93
—	—	—	—	—	18·4	29·51	7·83	5·66	1·64
1·5	—	—	—	·08	·9	—	—	—	·03
—	—	—	—	—	—	—	—	—	—
881·4	8·89	40·11	21·57	52·14	813·5	49·97	72·79	25·63	52·43
822·3	39·55	57·81	21·31	50·10	—	—	—	—	—

will be given in future years.



ABSTRACT No. XI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at MAURITIUS during the Year 1885, with the Ratios per

Orders.	Average Strength, 858.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	<b>I.—General Diseases.</b>								
	<i>Febrile Group.</i>								
	Eruptive Fevers	{ Small-pox	—	—	—	—	—	—	—
		{ Other	—	—	—	—	—	—	—
	Continued "	{ Enteric	2	2	—	2	—	—	·05
		{ Other	1	—	—	—	—	—	—
	Yellow Fever	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	529	3	—	3	—	—	10·98
	Cholera	-	—	—	—	—	—	—	—
	Other Diseases	-	1	—	—	—	—	—	·03
	Total	-	533	5	—	5	—	—	11·06
	<i>Constitutional Group.</i>								
	Rheumatism	-	15	—	—	—	—	—	·74
	Primary Syphilis	-	46	—	—	—	—	—	8·41
	Secondary "	-	8	—	—	—	—	—	·50
	Tubercular diseases	-	3	—	—	—	1	—	·29
	Scurvy and Purpura	-	—	—	—	—	—	—	—
	Other Diseases	-	—	—	—	—	—	—	—
	Total	-	72	—	—	—	1	—	4·94
	<b>II.—Local Diseases.</b>								
	<i>Diseases of the—</i>								
1	Nervous System	-	5	—	—	—	1	2	·29
2	Eye	-	9	—	—	—	—	—	·64
3	Ear	-	3	—	—	—	—	—	·09
4	Nose	-	—	—	—	—	—	—	—
5	Circulatory System	-	14	—	—	—	2	1	1·03
6	Absorbent "	-	10	—	—	—	—	—	·94
7	Ductless Glands	-	—	—	—	—	—	—	—
8	Respiratory System	-	17	—	—	—	1	—	·65
9	Digestive "	-	87	1	—	1	4	2	2·53
10	Urinary { Gonorrhœa	-	32	—	—	—	—	—	2·01
	System { Sequelæ of Gonorrh.	-	3	—	—	—	—	—	·36
		{ Other diseases	6	—	—	—	—	—	·09
11	Generative System	-	8	—	—	—	—	—	·40
12	Organs of Locomotion	-	2	—	—	—	—	—	·06
13	Cellular Tissue	-	14	—	—	—	—	—	·45
14	Cutaneous System	-	19	—	—	—	—	—	·79
	III.—Debility	-	21	—	—	—	5	—	1·36
	IV.—Poisons	-	1	—	—	—	—	—	·08
	<b>V.—Injuries.</b>								
1	General	-	—	—	—	—	—	—	—
2	Local	-	42	—	—	—	—	—	1·71
3	In action	-	—	—	—	—	—	—	—
	No appreciable disease	-	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	-	—	—	—	—	—	—	—
	General Total	-	898	6	—	6	14	5	29·51
	Average of 10 years, 1875–84		—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS  
1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 for 1879-84.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·4	—	—	—	·04
5·6	5·59	—	—	·14	6·4	2·73	·46	—	·71
2·8	—	—	—	—	57·5	—	—	—	1·69
1477·6	8·38	—	—	30·67	1198·7	5·47	20·51	—	35·28
—	—	—	—	—	—	—	—	—	—
2·8	—	—	—	·08	·4	—	—	—	·01
1488·8	13·97	—	—	30·89	1263·4	8·20	20·97	—	37·73
41·9	—	—	—	2·07	81·4	—	1·82	1·82	2·11
128·5	—	—	—	9·52	146·8	—	—	—	11·30
22·8	—	—	—	1·40	70·2	—	1·37	—	5·88
8·4	—	2·79	—	·81	5·5	·46	2·28	1·82	·74
—	—	—	—	—	1·4	—	—	—	·10
—	—	—	—	—	3·2	—	·91	·46	·25
201·1	—	2·79	—	13·80	258·5	·46	6·38	4·10	19·88
14·0	—	2·79	5·59	·81	11·8	—	3·65	·91	·93
25·1	—	—	—	1·79	8·7	—	—	·46	·64
8·4	—	—	—	·25	16·8	—	—	·45	·80
—	—	—	—	—	—	—	—	—	—
39·1	—	5·59	2·79	2·88	28·3	·91	5·92	4·56	2·19
27·9	—	—	—	2·62	42·8	—	—	—	3·95
—	—	—	—	—	—	—	—	—	—
47·5	—	2·79	—	1·81	43·3	—	·46	·91	1·88
243·0	2·79	11·17	5·59	7·07	243·9	4·56	2·73	1·86	8·11
89·4	—	—	—	5·70	94·3	—	—	—	5·64
8·4	—	—	—	1·00	20·1	—	·91	·46	1·73
16·8	—	—	—	·25	14·6	·91	·46	—	1·14
22·3	—	—	—	1·12	6·4	—	—	—	·52
5·6	—	—	—	·17	3·6	—	·46	·46	·22
39·1	—	—	—	1·26	32·8	—	—	—	1·07
53·1	—	—	—	2·21	77·0	—	—	—	2·51
58·7	—	13·97	—	3·80	46·0	—	9·57	3·19	2·17
2·8	—	—	—	·22	6·4	·46	—	—	·17
—	—	—	—	—	·9	—	·91	—	·10
117·3	—	—	—	4·78	144·5	·46	·91	—	4·57
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	·5	—	—	—	·01
—	—	—	—	—	—	—	—	—	—
2508·4	16·76	39·10	13·97	82·43	2364·6	15·96	53·33	16·86	95·96
2186·9	17·21	45·20	14·38	79·15	—	—	—	—	—

will be given in future years.

ABSTRACT No. XII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS  
TROOPS stationed at CEYLON during the Year 1885, with the Ratios

Orders.	Average Strength, 809.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	<b>I.—General Diseases.</b>							
	<i>Febrile Group.</i>							
	Eruptive Fevers { Small-pox	—	—	—	—	—	—	—
	Other -	1	—	—	—	—	—	·06
	Continued „ { Enteric -	1	1	—	1	—	—	·02
	Other -	64	—	—	—	—	—	1·96
	Yellow Fever -	—	—	—	—	—	—	—
	Paroxysmal Fevers -	66	—	—	—	—	—	2·33
	Cholera -	—	—	—	—	—	—	—
	Other Diseases -	—	—	—	—	—	—	—
	Total -	132	1	—	1	—	—	4·37
	<i>Constitutional Group.</i>							
	Rheumatism -	20	—	—	—	1	—	1·65
	Primary Syphilis -	126	—	—	—	—	—	8·92
	Secondary „ -	19	—	—	—	—	—	2·33
	Tubercular diseases -	2	1	—	1	3	2	·57
	Scurvy and Purpura -	—	—	—	—	—	—	—
	Other Diseases -	—	—	—	—	—	—	—
	Total -	167	1	—	1	4	2	13·47
	<b>II.—Local Diseases.</b>							
	<i>Diseases of the—</i>							
1	Nervous System -	5	—	—	—	3	4	·40
2	Eye -	26	—	—	—	—	1	·80
3	Ear -	19	—	—	—	1	2	·77
4	Nose -	—	—	—	—	—	—	—
5	Circulatory System -	10	—	—	—	1	—	·67
6	Absorbent „ -	20	—	—	—	—	—	2·86
7	Ductless Glands -	—	—	—	—	—	—	—
8	Respiratory System -	15	1	—	1	1	1	1·00
9	Digestive „ -	133	3	1	4	8	2	7·37
10	Urinary { Gonorrhœa	117	—	—	—	—	—	6·89
	System { Sequelæ of Gonorr.	16	—	—	—	—	—	·47
	Other diseases -	18	—	—	—	—	—	·65
11	Generative System -	15	—	—	—	—	—	1·07
12	Organs of Locomotion -	2	—	—	—	—	1	·16
13	Cellular Tissue -	19	—	—	—	—	—	·51
14	Cutaneous System -	98	—	—	—	—	—	3·47
	III.—Debility	15	—	—	—	4	1	1·32
	IV.—Poisons	12	—	—	—	—	—	·37
	<i>V.—Injuries.</i>							
1	General -	—	—	—	—	—	—	—
2	Local -	111	1	—	1	2	2	4·51
3	In action -	—	—	—	—	—	—	—
	No appreciable disease -	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	General Total -	950	7	1	8	24	16	51·13
	Average of 10 years, 1875-84	—	—	—	—	—	—	—

\* The average ratios for 10 years

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
1·2	—	—	—	·08	·7	—	—	—	·03
1·2	1·24	—	—	·02	2·8	1·73	—	—	·20
79·1	—	—	—	2·42	84·6	—	—	—	2·93
—	—	—	—	—	—	—	—	—	—
81·6	—	—	—	2·88	24·5	·34	·17	—	·96
—	—	—	—	—	·2	—	—	—	—
—	—	—	—	—	3·4	—	—	—	·11
163·1	1·24	—	—	5·40	116·2	2·07	·17	—	4·23
24·7	—	1·24	—	2·04	27·8	—	·86	·69	1·28
155·7	—	—	—	11·03	145·2	—	·17	—	9·40
23·5	—	—	—	2·88	29·2	—	1·73	·69	2·28
2·5	1·24	3·70	2·47	·70	11·4	2·42	5·53	3·28	1·27
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	1·2	—	—	—	·06
206·4	1·24	4·94	2·47	16·65	214·8	2·42	8·29	4·66	14·29
6·2	—	3·70	4·94	·49	18·0	·34	5·01	·52	2·68
32·2	—	—	1·24	·99	18·5	—	1·21	·52	1·15
23·5	—	1·24	2·47	·95	16·1	—	·86	·52	·55
—	—	—	—	—	1·0	—	—	—	·07
12·4	—	1·24	—	·83	16·6	·52	3·46	1·56	1·17
24·7	—	—	—	3·54	53·9	—	·86	·17	4·95
—	—	—	—	—	—	—	—	·17	—
18·5	1·24	1·24	1·24	1·24	32·1	·86	2·07	1·38	2·00
164·4	4·94	9·89	2·47	9·11	264·8	6·39	16·58	2·42	12·43
144·6	—	—	—	8·52	101·4	—	—	—	5·68
19·8	—	—	—	·58	16·1	—	—	—	·96
22·3	—	—	—	·80	15·2	—	—	—	·61
18·5	—	—	—	1·32	19·0	—	·17	·17	·85
2·5	—	—	1·24	·20	4·8	—	1·21	·52	·44
23·5	—	—	—	·63	30·9	·17	·17	·17	1·01
121·2	—	—	—	4·29	105·2	—	·35	·69	3·73
18·5	—	4·94	1·24	1·63	24·0	—	4·84	2·07	1·58
14·8	—	—	—	·46	14·3	·35	—	—	·27
—	—	—	—	—	·2	1·73	·17	·17	·02
137·2	1·24	2·47	2·47	5·57	155·1	·52	·35	·69	4·75
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	2·4	—	—	—	·09
—	—	—	—	—	—	—	—	—	—
1174·3	9·89	29·66	19·78	63·20	1240·6	15·37	45·77	16·40	63·51
1085·4	14·51	38·23	14·11	57·45	—	—	—	—	—

will be given in future years.

ABSTRACT No. XIII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed in CHINA and the STRAITS SETTLEMENTS, during the Year 1885,

Orders.	Average Strength, 2,188.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	<b>I. General Diseases.</b>							
	<i>Febrile Group.</i>							
	Eruptive Fevers { Small-pox	—	—	—	—	—	—	—
	{ Other	—	—	—	—	—	—	—
	Continued { Enteric	4	1	—	1	—	—	·80
	{ Other	422	1	—	1	—	—	9·58
	Yellow Fever	—	—	—	—	—	—	—
	Paroxysmal Fevers	349	1	—	1	—	—	8·36
	Cholera	19	12	—	12	—	—	·32
	Other Diseases	7	1	—	1	—	—	·10
	<b>Total</b>	<b>801</b>	<b>16</b>	<b>—</b>	<b>16</b>	<b>—</b>	<b>—</b>	<b>19·11</b>
	<i>Constitutional Group.</i>							
	Rheumatism	48	1	—	1	—	—	1·70
	Primary Syphilis	75	—	—	—	—	—	5·76
	Secondary „	54	—	—	—	4	1	4·05
	Tubercular diseases	7	1	1	2	10	7	·85
	Scurvy and Purpura	—	—	—	—	—	—	—
	Other Diseases	4	—	—	—	1	—	·26
	<b>Total</b>	<b>188</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>15</b>	<b>8</b>	<b>12·62</b>
	<b>II.—Local Diseases.</b>							
	<i>Diseases of the—</i>							
1	Nervous System	37	1	—	1	6	1	1·95
2	Eye	36	—	—	—	4	5	2·20
3	Ear	31	—	—	—	2	3	·96
4	Nose	1	—	—	—	—	—	·01
5	Circulatory System	37	1	—	1	13	9	2·35
6	Absorbent „	38	—	—	—	—	—	3·32
7	Ductless Glands	—	—	—	—	—	—	—
8	Respiratory System	54	—	—	—	5	4	2·84
9	Digestive „	285	2	—	2	12	4	10·14
10	Urinary { Gonorrhœa	154	—	—	—	—	—	8·74
	System { Sequelæ of Gonorr.	21	—	—	—	—	—	·96
	{ Other diseases	34	—	—	—	4	1	2·38
11	Generative system	44	—	—	—	—	—	1·92
12	Organs of Locomotion	10	—	—	—	2	2	·63
13	Cellular Tissue	92	—	—	—	1	1	3·11
14	Cutaneous System	258	—	—	—	1	—	8·93
	<b>III.—Debility</b>	<b>40</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>21</b>	<b>8</b>	<b>2·47</b>
	<b>IV.—Poisons</b>	<b>32</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>1·04</b>
	<b>V.—Injuries.</b>							
1	General	—	1	—	1	—	—	—
2	Local	256	1	—	1	2	2	8·22
3	In action	—	—	—	—	—	—	—
	No appreciable disease	5	—	—	—	—	—	·07
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	<b>General total</b>	<b>2,454</b>	<b>24</b>	<b>1</b>	<b>25</b>	<b>88</b>	<b>48</b>	<b>93·97</b>
	<b>Average of 10 years, 1875–84</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>

\* The average ratios for 10 year

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the  
with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	·4	—	—	—	·05
—	—	—	—	—	1·7	—	—	—	·06
1·8	·46	—	—	·36	·9	·09	—	—	·06
192·9	·46	—	—	4·35	160·9	·46	·74	—	4·83
—	—	—	—	—	—	—	—	—	—
159·5	·46	—	—	3·82	118·9	·74	1·48	—	3·52
8·7	5·48	—	—	·15	—	—	—	—	—
3·2	·46	—	—	·05	2·1	·37	—	—	·07
366·1	7·81	—	—	8·73	284·9	1·66	2·22	—	8·09
21·9	·46	—	—	·78	17·3	—	—	·19	·90
34·3	—	—	—	2·63	52·5	—	—	—	4·66
24·7	—	1·83	·46	1·85	18·7	·09	·55	·65	1·37
3·2	·91	4·57	3·20	·39	13·0	1·02	7·40	3·97	1·82
—	—	—	—	—	·2	—	—	—	—
1·8	—	·46	—	·12	2·4	·19	·74	—	·18
85·9	1·37	6·86	3·66	5·77	99·1	1·30	8·69	4·81	8·93
16·9	·46	2·74	·46	·89	17·1	1·20	3·33	·83	1·52
16·4	—	1·83	2·28	1·01	12·5	—	1·11	1·02	·88
14·2	—	·91	1·37	·44	11·9	—	·65	·28	·64
·5	—	—	—	—	·4	—	·09	—	·01
16·9	·46	5·94	4·11	1·07	22·7	·83	4·72	3·14	1·97
17·4	—	—	—	1·52	25·0	—	—	—	2·70
—	—	—	—	—	—	—	—	—	—
24·7	—	2·29	1·83	1·30	39·4	·09	1·39	·65	2·24
130·3	·91	5·48	1·83	4·63	148·8	1·29	4·71	1·20	6·54
70·4	—	—	—	3·99	87·2	—	—	—	5·38
9·6	—	—	—	·44	16·3	—	—	—	1·03
15·5	—	1·83	·46	1·09	10·2	·09	1·39	·19	·95
20·1	—	—	—	·88	17·0	—	·28	·28	·81
4·6	—	·91	·91	·29	4·8	·10	·83	·55	·51
42·0	—	·46	·46	1·42	20·0	—	—	—	·86
117·9	—	·46	—	4·08	65·3	—	·46	·09	2·68
18·3	—	9·60	3·66	1·13	39·2	—	8·87	1·94	2·58
14·6	·46	—	—	·48	10·1	·09	—	—	·33
—	·46	—	—	—	·2	·19	—	—	·01
117·0	—	·91	·91	3·76	108·9	·37	·55	·55	3·73
—	—	—	—	—	—	·28	—	—	—
2·3	—	—	—	·03	3·2	—	—	—	·06
—	—	—	—	—	—	—	—	—	—
1121·6	11·43	40·22	21·94	42·95	1044·2	7·49	39·29	15·53	52·45
1030·4	10·53	42·03	17·00	49·52	—	—	—	—	—

will be given in future years.

ABSTRACT No. XIV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed at BENGAL during the Year 1885, with the Ratios per

Orders.	Average Strength, 35,101.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally discharged the Service.	
	<b>I.—General Diseases.</b>							
	<b>Febrile Group.</b>							
	Eruptive Fevers { Small Pox - 5	—	—	—	—	—	—	·25
	{ Other - 742	—	—	—	—	—	—	17·15
	Continued „ { Enteric - 486	142	—	142	7	—	—	62·32
	{ Other - 3,348	3	—	3	2	—	—	99·27
	Yellow Fever - - -	—	—	—	—	—	—	—
	Paroxysmal Fevers - -	17,896	19	—	19	42	2	482·50
	Cholera - - -	61	87	—	37	—	—	1·44
	Other diseases - - -	71	8	—	8	—	—	5·47
	<b>Total of Febrile group</b>	<b>22,609</b>	<b>209</b>	<b>—</b>	<b>209</b>	<b>51</b>	<b>2</b>	<b>668·40</b>
	<b>Constitutional Group.</b>							
	Rheumatism - - -	1,231	3	—	3	15	22	71·78
	Primary Syphilis - -	4,539	—	—	—	—	—	304·42
	Secondary „ - - -	1,073	—	—	—	26	8	91·68
	Tubercular Diseases -	211	30	10	40	73	66	35·36
	Scurvy and Purpura -	113	1	—	1	1	—	6·44
	Other diseases - - -	285	1	1	2	18	7	17·10
	<b>Total of Constitutional group</b>	<b>7,452</b>	<b>35</b>	<b>11</b>	<b>46</b>	<b>133</b>	<b>103</b>	<b>526·78</b>
	<b>II.—Local Diseases.</b>							
	<b>Diseases of the—</b>							
1	Nervous System - - -	558	41	—	41	81	72	53·34
2	Eye - - -	506	—	—	—	23	20	26·12
3	Ear - - -	530	—	—	—	25	21	23·06
4	Nose - - -	31	—	—	—	1	—	1·23
5	Circulatory System -	465	21	—	21	112	105	39·22
6	Absorbent „ - - -	566	—	—	—	—	1	51·10
7	Ductless Glands - - -	4	—	—	—	1	—	·43
8	Respiratory System -	1,372	23	—	23	14	17	60·59
9	Digestive „ - - -	7,662	61	8	69	118	33	264·44
10	Urinary { Gonorrhœa - 5,308	—	—	—	—	—	—	361·18
	System { Sequelæ of Gonorr. - 683	—	—	—	—	5	—	42·32
	Other diseases - - -	450	8	2	10	9	7	16·69
11	Generative System - -	423	—	—	—	4	1	22·92
12	Organs of Locomotion -	211	—	—	—	19	26	15·15
13	Cellular Tissue - - -	704	2	—	2	1	4	29·49
14	Cutaneous System - - -	2,905	—	—	—	9	3	118·68
	<b>III.—Debility</b> - - -	<b>442</b>	<b>1</b>	<b>—</b>	<b>1</b>	<b>78</b>	<b>54</b>	<b>21·58</b>
	<b>IV.—Poisons</b> - - -	<b>325</b>	<b>7</b>	<b>—</b>	<b>7</b>	<b>—</b>	<b>—</b>	<b>8·77</b>
	<b>V.—Injuries.</b>							
1	General - - -	12	19	—	19	—	—	·52
2	Local - - -	4,574	29	—	29	30	14	167·48
3	In action - - -	—	—	—	—	—	—	—
	No appreciable disease -	98	—	—	—	—	—	3·48
	Cause unknown (refers to deaths only).	—	1	—	1	—	—	†45·27
	<b>General Total</b> - - -	<b>57,890</b>	<b>457</b>	<b>21</b>	<b>478</b>	<b>714</b>	<b>483</b>	<b>2,568·24</b>
	<b>Average of 10 years, 1875–84</b>	—	—	—	—	—	—	—

\* The average ratios for 10 years will be given in future years.

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS  
1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000 from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally dis- charged.	Con- stantly Sick.†
·2	—	—	—	·01	1·0	·10	—	—	·10
21·1	—	—	—	·49	1·9	·01	—	—	·09
13·8	4·05	·20	—	1·77	8·5	3·05	·08	—	1·07
95·4	·08	·06	—	2·83	134·4	·14	·06	—	3·93
—	—	—	—	—	—	—	—	—	—
509·9	·54	1·19	·06	13·75	579·1	1·18	2·09	·08	13·79
1·7	1·05	—	—	·04	4·2	3·10	—	—	·06
2·0	·23	—	—	·15	3·9	·11	—	·02	·20
644·1	5·95	1·45	·06	19·04	733·0	7·69	2·23	·10	19·24
35·1	·08	·43	·62	2·05	37·5	·03	1·53	·78	2·16
129·3	—	—	—	8·67	87·9	—	·04	—	6·41
30·6	—	·74	·23	2·61	24·0	·03	1·03	·50	1·98
6·0	1·14	2·08	1·88	1·01	7·0	1·39	2·40	1·71	1·06
3·2	·03	·03	—	·18	1·3	·04	—	—	·09
8·1	·06	·51	·20	·49	4·3	·12	·66	·16	·34
212·3	1·31	3·79	2·93	15·01	162·0	1·61	5·66	3·15	12·04
15·9	1·17	2·31	2·05	1·52	20·1	2·25	2·98	1·14	1·53
14·4	—	·65	·57	·74	15·8	—	·65	·63	·90
15·1	—	·71	·60	·66	12·7	—	·67	·57	·64
·9	—	·03	—	·04	·8	—	·02	·01	·03
13·2	·60	3·19	2·99	1·12	16·0	·57	4·15	3·05	1·31
16·1	—	—	·03	1·46	18·0	—	·06	·04	1·61
·1	—	·03	—	·01	·3	—	·02	·01	·03
39·1	·65	·40	·49	1·73	53·8	1·38	1·13	·83	2·55
218·3	1·97	3·36	·94	7·53	235·0	3·65	6·45	2·02	8·84
151·2	—	—	—	10·29	115·7	—	—	—	7·44
19·5	—	·14	—	1·21	16·8	—	·17	·06	1·16
12·8	·28	·26	·20	·48	10·6	·21	·38	·21	·51
12·0	—	·12	·03	·65	12·4	·01	·11	·08	·64
6·0	—	·54	·74	·43	5·4	·07	·70	·47	·50
20·1	·06	·03	·11	·84	18·5	·02	·11	·05	·88
82·8	—	·26	·08	3·38	79·3	—	·29	·21	3·30
12·6	·03	2·22	1·54	·61	29·7	·08	7·18	3·48	1·51
9·3	·20	—	—	·25	5·5	·31	—	—	·22
·3	·54	—	—	·01	·3	·50	·02	·01	·02
130·3	·82	·85	·40	4·77	103·6	·93	·90	·80	4·14
2·8	—	—	—	·10	—	—	·09	·01	—
—	·03	—	—	†1·29	1·8	—	—	—	·07
1649·2	13·61	20·34	13·76	73·17	1667·1	19·28	33·97	16·93	69·11
1553·2	18·48	36·23	16·82	64·90	—	—	—	—	—

† Camps of Exercise.

‡ For four years only.



ABSTRACT No. XV.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the ADMISSIONS and DEATHS which took place at the CHIEF STATIONS in the BENGAL COMMAND during the year 1885.

Divisions.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in India.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1875 to 1884.	
					Admissions.	Deaths.	Admissions.	Deaths.
PRESIDENCY	Fort William	843	1,390	12	1648.9	14.23	1026.2	8.21
	Dum-Dum	686	839	9	1223.0	13.12	1272.9	12.05
	Barrackpore	206	307	2	1490.3	9.71	1898.9	13.44
	Darjeeling	214	257	2	1200.9	9.35	1071.0	18.11
ALLAHABAD	Allahabad	598	1,221	14	2041.8	23.41	1534.3	20.31
	Fort Allahabad	213	368	1	1727.7	4.69	1615.1	19.64
	Cawnpore	853	957	17	1121.9	19.93	1402.9	16.73
	Dinapore	961	1,316	12	1369.4	12.49	1520.7	14.78
	Benares	366	853	9	2330.6	24.59	1673.2	26.11
	Chunar	77	287	—	3727.3	—	2448.3	41.61
OUDH	Lucknow	2,219	3,128	32	1409.6	14.42	1392.8	16.71
	Military Prison	45	45	—	1000.0	—	1311.6	36.23
	Sitapur	413	690	10	1692.5	24.21	1322.4	19.64
	Fyzabad	924	1,199	6	1297.6	6.49	1562.8	22.74
ROHILCUND	Bareilly	787	1,258	9	1598.5	11.44	1245.9	11.86
	Moradabad	116	431	1	3715.0	8.62	1466.3	18.67
	Shahjehanpur	264	351	4	1329.5	15.15	1196.1	14.99
	Ranikhet	594	603	2	1015.2	3.37	953.1	8.77
	Choubutia	256	449	3	1763.9	11.72	1252.6	6.79
	Naini Tal	204	334	2	1637.3	9.80	1374.0	10.44
SAUGOR	Jubbulpore	614	853	10	1380.3	16.29	1374.9	8.75
	Saugor	374	447	1	1189.8	2.67	1472.4	14.35
	Nowgong	522	444	4	1378.9	12.42	1492.7	17.42
	Pachmarhi	114	250	2	2193.0	17.54	1383.5	9.06
GWALIOR	Morar	1,183	2,379	16	2011.0	13.52	1739.1	24.55
	Fortress Gwalior	438	534	6	1219.2	13.70	1349.0	23.44
	Jhansi	364	687	—	1887.4	—	1870.8	18.57
MEERUT	Meerut	1,779	4,122	27	2317.0	15.18	1565.7	15.49
	Fatehgarh	177	427	4	2412.4	22.60	1685.8	15.40
	Agra	931	1,725	10	1852.9	10.74	1637.5	13.79
	Muttra	383	1,138	16	2971.3	41.78	1400.1	18.80
	Delhi	402	1,920	12	4155.8	25.97	2938.5	19.85
	Roorkee	405	1,246	8	2517.2	16.16	1258.5	15.01
	Chakrata	468	859	3	1835.5	6.41	850.4	6.20
	Landour	152	305	4	2006.6	26.32	1697.7	15.38
SIRHIND	Umballa	1,463	2,294	23	1568.1	15.72	1482.9	12.19
	Jullundur	434	780	10	1797.2	23.04	1632.6	17.05
	Subathu	319	350	6	1097.2	18.81	1185.7	17.93
	Dagshai	692	978	5	1413.3	7.23	1038.8	9.59
	Jutogh	225	815	3	1400.0	13.33	1166.5	9.04
	Solon	184	827	2	1777.2	10.87	1145.5	11.41
	Kasauli	284	938	4	3302.8	14.08	1766.7	22.57
LAHORE	Meean Meer	737	1,695	17	2299.9	23.07	2971.0	29.84
	Fort Lahore	120	258	2	2150.0	16.67	2545.1	41.99
	Ferozepore	832	2,214	7	2661.1	8.41	1686.4	13.21
	Mooltan	809	1,360	11	1681.1	13.60	1833.8	12.02
	Amritsar	200	440	3	2200.0	15.00	2754.5	15.85
	Bhagsu	45	47	—	1044.4	—	1240.0	16.33
	Dalhousie	226	519	1	2296.5	4.42	1722.1	7.65

\* 7 years (1878-84).

† 3 years (1882-84).  
‡ 8 years (1874-78 and 1882-84).

‡ 6 years (1879-84).

Divisions.	Stations.	Average Annual Strength.	Admitted into Hospital.	Died in India.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1875 to 1884.	
					Admissions.	Deaths.	Admissions.	Deaths.
RAWAL PINDI	Rawal Pindi -	2,294	2,547	31	1110·3	13·51	1628·8	13·47
	Port Attock -	103	240	2	2417·5	19·42	2436·5	25·54
	Sialkot -	867	1,212	8	1397·9	9·23	1636·7	21·25
	Campbellpore -	140	179	2	1278·6	14·29	1514·5	22·24
	Khyra Gully -	47	84	1	1787·2	21·28	1353·1	27·16
	Barra Gully -	31	41	—	1322·6	—	*1808·2	3·02
	Chungla Gully -	17	—	—	—	—	†1344·0	7·61
	Kalabagh -	50	93	1	1860·0	20·00	*1603·3	10·58
	Kooldunnah -	317	412	1	1299·7	3·15	*1259·9	15·40
	Camp Gharial -	156	168	—	1076·9	—	† 940·7	—
	" Topa -	83	114	1	1373·5	12·05	‡ 935·7	15·06
	Murree -	208	327	1	1572·1	4·81	2010·5	23·29
PESHAWAR	Peshawar -	1,422	2,586	16	1818·6	11·25	2528·2	21·76
	Nowshera -	537	745	8	1347·3	14·90	1752·2	19·13
	Cherat -	489	719	10	1470·3	20·45	§1443·9	15·99
MARCHING	Troops marching -	1,931	1,526	9	782·2	4·61	969·9	15·01
	Camps of Exercise -	724	747	2	1031·7	2·76	—	—

\* 10 years (1874-79 and 1881-84).  
 ‡ 1 year (1894).

† 8 years (1875-78 and 1881-84).  
 § 9 years (1875-78 and 1880-84).

ABSTRACT No. XVI.—TABLE, taken from the REPORT of the PRINCIPAL  
FERENT CLASSES of DISEASES in each of the MILITARY DIVISIONS in the

Order.	Military Divisions.	Pre- sidency.		Allaha- bad.		Oudh.		Rohil- cund.		Saugor.	
	Average Strength.	1,949		3,068		3,601		2,221		1,424	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	<b>I. General Diseases.</b>										
	<i>Febrile Group.</i>										
	Eruptive Fevers . . . . .	143	—	13	—	413	—	2	—	—	—
	Continued " . . . . .	246	2	802	20	469	23	205	6	59	2
	Yellow Fever " . . . . .	—	—	—	—	—	—	—	—	—	—
	Paroxysmal Fevers . . . . .	562	2	739	3	798	1	772	—	522	1
	Cholera . . . . .	6	5	16	9	9	1	—	—	1	1
	Other Diseases . . . . .	3	—	4	1	4	1	5	1	3	—
	Total . . . . .	960	9	1,574	33	1,723	26	984	7	585	4
	<i>Constitutional Group.</i>										
	Rheumatism . . . . .	63	—	97	1	107	—	64	—	36	—
	Primary Syphilis . . . . .	288	—	495	—	435	—	315	—	124	—
	Secondary " . . . . .	56	—	117	—	173	—	73	—	71	—
	Tubercular Diseases . . . . .	9	1	18	5	22	3	21	2	10	3
	Scurvy and Purpura . . . . .	—	—	9	1	3	—	9	—	1	—
	Other diseases . . . . .	13	—	22	—	16	—	8	1	6	—
	Total . . . . .	429	1	758	7	756	3	490	3	248	3
	<b>II. Local Diseases.</b>										
	<i>Diseases of the—</i>										
1	Nervous System . . . . .	38	2	52	4	57	2	34	1	11	—
2	Eye . . . . .	14	—	53	—	35	—	34	—	24	—
3	Ear . . . . .	44	—	44	—	50	—	46	—	25	—
4	Nose . . . . .	1	—	1	—	4	—	—	—	—	—
5	Circulatory System . . . . .	17	1	29	1	28	1	31	2	7	1
6	Absorbent " . . . . .	40	—	60	—	47	—	39	—	44	—
7	Ductless Glands . . . . .	—	—	—	—	2	—	—	—	—	—
8	Respiratory System . . . . .	50	3	126	1	96	3	76	1	54	1
9	Digestive " . . . . .	310	2	796	5	696	10	563	6	359	4
10	Urinary } Gonorrhoea . . . . .	351	—	505	—	518	—	320	—	244	—
	System. } Sequelae of Gonorrhoea . . . . .	36	—	68	—	79	—	56	—	39	—
	Other Diseases . . . . .	15	—	43	1	30	—	59	—	12	—
11	Generative System . . . . .	19	—	28	—	45	—	15	—	11	—
12	Organs of Locomotion . . . . .	12	—	15	—	17	—	6	—	5	—
13	Cellular Tissue . . . . .	39	—	74	—	80	—	38	—	12	—
14	Cutaneous System . . . . .	156	—	346	—	283	—	230	—	92	—
	<b>III. Debility</b> . . . . .	19	—	28	—	20	—	25	—	17	—
	<b>IV. Poisons</b> . . . . .	30	2	20	—	31	—	22	—	20	—
	<b>V. Injuries.</b>										
1	General . . . . .	—	2	—	1	—	1	—	1	1	2
2	Local . . . . .	205	3	362	—	470	2	343	—	181	2
3	In action . . . . .	—	—	—	—	—	—	—	—	—	—
	No appreciable disease . . . . .	8	—	20	—	4	—	10	—	1	—
	Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
	General total . . . . .	2,793	25	5,002	53	5,071	48	3,426	21	1,992	17

MEDICAL OFFICER, showing the PREVALENCE and MORTALITY of the DIF-  
BENGAL COMMAND with the ratios per 1,000 of Strength during the year 1885.

Gwalior.		Meerut.		Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Troops on the March.		Camps of Exercise.		Total.	
1,985		4,847		3,601		2,969		4,313		2,448		1,951		724		35,101	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	—	—	—	167	—	2	—	1	—	—	—	6	—	—	—	747	—
296	11	262	25	350	15	280	12	247	15	505	14	64	—	19	—	3,834	145
1,255	—	6,123	3	1,609	4	5,241	2	789	—	1,048	3	303	—	136	—	17,906	19
5	5	10	7	2	—	4	3	5	4	2	2	1	—	—	—	61	37
1	—	19	3	13	—	5	1	5	1	4	2	4	—	1	—	71	8
1,557	16	6,414	38	2,141	19	5,532	18	1,046	20	1,559	19	378	—	156	—	22,609	209
62	—	195	2	145	—	114	—	158	—	122	—	43	—	25	—	1,231	3
79	—	681	—	431	—	240	—	869	—	211	—	240	—	113	—	4,539	—
35	—	140	—	137	—	62	—	129	—	41	—	22	—	17	—	1,073	—
6	1	33	3	25	5	27	1	30	6	9	—	—	—	1	—	211	30
9	—	40	—	5	—	17	—	1	—	17	—	1	—	1	—	113	1
14	—	37	—	62	—	80	—	15	—	11	—	—	—	1	—	285	1
205	1	1,126	5	805	5	549	1	1,202	6	411	—	315	—	158	—	7,452	35
30	1	76	3	54	7	53	6	101	9	20	5	15	1	8	—	553	41
40	—	54	—	85	—	39	—	42	—	67	—	12	—	7	—	506	—
40	—	71	—	45	—	70	—	47	—	40	—	3	—	5	—	530	—
3	—	8	—	6	—	1	—	4	—	3	—	—	—	—	—	31	—
25	1	126	3	75	3	34	4	64	1	17	2	7	—	5	1	465	21
31	—	73	—	43	—	35	—	65	—	54	—	27	—	8	—	566	—
—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	4	—
90	—	241	5	141	4	149	2	144	—	142	1	37	1	26	1	1,372	23
614	2	1,151	13	926	5	623	4	790	5	578	5	168	—	83	—	7,062	61
228	—	880	—	447	—	431	—	661	—	382	—	229	—	112	—	5,308	—
45	—	76	—	47	—	48	—	55	—	102	—	20	—	12	—	683	—
20	—	51	2	69	2	50	1	47	1	40	1	8	—	6	—	450	8
42	—	66	—	40	—	37	—	53	—	44	—	11	—	12	—	423	—
15	—	30	—	31	—	15	—	23	—	24	—	7	—	11	—	211	—
43	—	99	2	84	—	63	—	71	—	33	—	42	—	21	—	704	2
203	—	466	—	269	—	308	—	297	—	161	—	68	—	26	—	2,905	—
46	—	62	—	62	—	51	—	31	—	45	1	26	—	10	—	442	1
17	—	37	1	52	—	22	3	57	1	14	—	2	—	1	—	325	7
—	—	3	4	3	2	—	—	3	1	—	—	2	5	—	—	12	19
303	1	620	8	549	6	412	2	605	4	295	—	149	1	80	—	4,574	29
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	—	12	—	8	—	11	—	18	—	3	—	—	—	—	—	98	—
—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
3,600	22	11,742	84	5,982	53	6,533	41	5,426	48	4,050	34	1,526	9	747	2	57,890	457

Ratio per 1,000

Order.	Military Divisions.				Pre-sidency.		Allahabad.		Oudh.		Rohilkund.		Saugor.	
	Average Strength.				1,949		3,068		3,601		2,221		1,424	
	Diseases.				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. General Diseases.														
Febrile Group.														
	Eruptive Fevers	.	.	.	73.4	—	4.2	—	114.7	—	.9	—	—	—
	Continued "	.	.	.	126.2	1.03	261.4	6.52	138.6	6.38	92.3	2.70	41.4	1.41
	Yellow Fever	.	.	.	—	—	—	—	—	—	—	—	—	—
	Paroxysmal Fevers	.	.	.	288.4	1.03	240.0	.98	221.6	.28	347.6	—	366.6	.70
	Cholera	.	.	.	3.1	2.56	5.2	2.93	2.5	.28	—	—	.7	.70
	Other diseases	.	.	.	1.5	—	1.3	.33	1.1	.28	2.2	.45	2.1	—
	Total	.	.	.	492.6	4.62	513.0	10.76	478.5	7.22	443.0	3.15	410.8	2.81
Constitutional Group.														
	Rheumatism	.	.	.	32.3	—	31.6	.3	29.7	—	28.8	—	25.3	—
	Primary Syphilis	.	.	.	147.8	—	161.4	—	120.8	—	141.8	—	87.1	—
	Secondary	.	.	.	28.7	—	38.1	—	48.1	—	32.9	—	48.9	—
	Tubercular Diseases	.	.	.	4.6	.51	5.9	1.62	6.1	.83	9.5	.90	7.0	2.10
	Scurvy and Purpura	.	.	.	—	—	2.9	.35	—	—	4.0	—	.7	—
	Other diseases	.	.	.	6.7	—	7.2	—	4.4	—	3.6	.45	4.2	—
	Total	.	.	.	220.1	.51	247.1	2.23	209.0	.83	220.6	1.35	174.2	2.10
II. Local Diseases.														
	Diseases of the—													
1	Nervous System	.	.	.	19.5	1.03	16.9	1.30	15.8	.56	15.3	.45	7.7	—
2	Eye	.	.	.	7.2	—	17.3	—	9.7	—	15.3	—	16.9	—
3	Ear	.	.	.	22.6	—	14.3	—	13.9	—	20.7	—	17.6	—
4	Nose	.	.	.	.5	—	.3	—	1.1	—	—	—	—	—
5	Circulatory System	.	.	.	8.7	.51	9.5	.33	7.8	.23	14.0	.90	4.9	.70
6	Absorbent	.	.	.	20.5	—	19.6	—	13.1	—	17.0	—	30.9	—
7	Ductless Glands	.	.	.	—	—	—	—	.6	—	—	—	—	—
8	Respiratory System	.	.	.	25.6	1.53	41.1	.33	26.7	.83	34.2	.42	37.9	.70
9	Digestive	.	.	.	159.1	1.03	259.5	1.62	193.3	2.77	255.7	2.70	252.1	2.8
10	Urinary (Gonorrhoea)	.	.	.	180.1	—	164.6	—	143.8	—	144.1	—	171.4	—
	Sequelæ of Gonorrhoea	.	.	.	18.5	—	22.2	—	21.9	—	25.2	—	27.4	—
	System (Other diseases)	.	.	.	7.7	—	14.0	.33	8.3	—	26.6	—	8.4	—
11	Generative System	.	.	.	9.7	—	9.1	—	12.5	—	6.8	—	7.7	—
12	Organs of Locomotion	.	.	.	6.2	—	4.9	—	4.7	—	2.7	—	3.5	—
13	Cellular Tissue	.	.	.	20.0	—	24.1	—	22.2	—	17.1	—	8.4	—
14	Cutaneous System	.	.	.	80.0	—	112.8	—	78.6	—	103.6	—	64.6	—
III. Debility														
		.	.	.	9.7	—	9.1	—	5.6	—	11.3	—	11.9	—
IV. Poisons														
		.	.	.	15.4	1.03	6.5	—	8.6	—	9.9	—	14.1	—
V. Injuries.														
1	General	.	.	.	—	1.03	—	.33	—	.28	—	.45	.7	1.41
2	Local	.	.	.	105.2	1.53	118.0	—	130.5	.56	154.4	—	127.1	1.41
3	In action	.	.	.	—	—	—	—	—	—	—	—	—	—
	No appreciable disease	.	.	.	4.1	—	6.5	—	1.1	—	4.5	—	.7	—
	Cause unknown (refers to deaths only)	.	.	.	—	—	—	—	—	—	—	—	—	—
	General Total	.	.	.	1433.0	12.32	1630.4	7.72	1408.2	13.33	1542.6	9.45	1398.9	11.94

of Mean Strength.

Gwalior.		Meerut.		Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Marching.		Camps of Exercise.		Total.	
1,985		4,947		3,601		2,909		4,313		2,448		1,951		724		35,101	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	—	—	—	46'4	—	7	—	2	—	—	—	3'1	—	—	—	21'3	—
140'1	5'54	54'0	5'15	97'2	4'17	94'3	4'04	57'2	3'48	208'3	5'72	32'8	—	26'2	—	109'2	4'13
632'2	—	1263'3	62	446'8	1'11	1091'6	67	132'7	—	428'1	1'22	155'3	—	187'9	—	509'9	54
2'5	2'52	2'1	1'45	6	—	1'3	1'01	1'2	89	8	82	5	—	—	—	1'7	1'08
5	—	3'9	62	3'6	—	1'7	34	1'2	23	1'6	—	2'1	—	1'4	—	2'0	23
784'3	8'06	1323'3	7'84	594'6	5'28	1139'6	6'06	242'5	4'64	636'8	7'76	193'8	—	215'5	—	644'1	5'95
31'3	—	40'2	41	40'3	—	38'4	—	36'6	—	49'8	—	22'0	—	34'5	—	35'1	09
39'8	—	140'5	—	110'7	—	83'9	—	201'5	—	86'2	—	127'6	—	156'0	—	129'3	—
17'6	—	28'9	—	38'0	—	20'9	—	29'9	—	16'8	—	11'3	—	23'5	—	30'6	—
3'0	50	6'8	62	6'9	1'39	9'1	34	7'0	1'59	3'7	—	—	—	1'4	—	6'0	85
4'5	—	8'3	—	1'4	—	5'7	—	2	—	0'9	—	5	—	1'4	—	3'2	03
7'1	—	7'6	—	17'2	—	26'9	—	3'5	—	4'5	—	—	—	1'4	—	8'1	03
103'3	50	232'3	1'03	223'5	1'39	184'0	34	278'7	1'39	167'9	—	161'4	—	218'2	—	212'3	1'00
15'1	50	15'7	62	15'0	1'94	17'8	2'02	23'4	2'09	11'9	2'04	7'7	51	11'0	—	15'9	1'17
20'1	—	11'1	—	23'6	—	13'1	—	9'7	—	27'4	—	6'2	—	9'7	—	14'4	—
20'1	—	14'7	—	12'5	—	23'6	—	10'9	—	16'3	—	1'5	—	6'9	—	15'1	—
1'5	—	1'7	—	1'7	—	3	—	9	—	1'2	—	—	—	—	—	9	—
12'6	50	26'0	62	20'8	83	11'5	1'35	14'8	23	6'9	82	3'6	—	6'9	1'38	13'2	80
15'6	—	15'1	—	11'9	—	11'8	—	15'1	—	22'1	—	13'8	—	11'0	—	16'1	—
—	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	1	—
45'3	—	40'7	1'03	39'2	1'11	50'2	67	33'4	—	58'0	—	41	19'0	51	35'9	39'1	85
309'3	1'01	237'5	2'68	257'2	1'39	209'8	1'35	183'1	1'16	236'1	2'04	86'1	—	114'6	—	218'3	1'74
114'9	—	181'5	—	124'1	—	145'2	—	153'3	—	156'1	—	117'4	—	154'7	—	151'2	—
22'7	—	15'7	—	13'1	—	16'2	—	12'8	—	41'7	—	10'3	—	16'6	—	19'5	—
10'1	—	10'5	41	19'2	56	16'8	34	10'9	23	16'3	41	4'1	—	8'3	—	12'8	23
21'2	—	13'6	—	11'1	—	12'5	—	12'3	—	13'0	—	3'6	—	16'6	—	712'0	—
7'6	—	6'2	—	8'6	—	5'1	—	5'3	—	9'8	—	3'6	—	15'2	—	6'0	—
21'7	—	20'4	41	23'3	—	21'2	—	16'5	—	15'5	—	21'5	—	29'0	—	20'1	06
102'3	—	96'1	—	74'7	—	103'7	—	68'9	—	65'8	—	34'9	—	35'9	—	82'8	—
23'2	—	12'8	—	17'2	—	17'2	—	7'2	—	18'4	41	13'3	—	13'8	—	12'6	03
8'6	—	7'6	21	14'4	—	7'4	1'01	13'2	23	5'7	—	1'0	—	1'4	—	9'3	20
—	—	6	83	8	56	—	—	7	23	—	—	1'0	2'57	—	—	3	54
152'6	50	127'9	1'65	152'5	1'66	138'8	67	140'3	93	120'5	—	76'4	51	110'5	—	130'3	82
1'5	—	2'5	—	2'2	—	3'7	—	4'2	—	1'2	—	—	—	—	—	2'8	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	09
1813'6	11'08	2422'5	17'33	1681'2	14'72	2200'4	13'61	1258'1	11'15	1654'4	13'89	782'2	4'61	1031'7	2'76	1649'2	13'02

**ABSTRACT No. XVII.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the STATIONS in the BENGAL COMMAND at which the ADMISSIONS and DEATHS from ENTERIC FEVER took place in each of the four quarters of the year 1885.**

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency	Fort William	—	—	1	—	—	—	—	—	1	—
Allahabad	Allahabad	4	—	8	2	8	3	—	1	20	6
	Cawnpore	—	—	4	3	5	4	3	1	12	8
	Dinapore	—	—	5	2	2	2	1	—	8	4
	Benares	1	—	3	1	3	1	—	—	7	2
	Chunar	—	—	1	—	—	—	—	—	1	—
Oudh	Lucknow	12	—	10	3	23	6	9	1	54	10
	Lucknow Military Prison	—	—	1	—	—	—	—	—	1	—
	Sitapur	2	—	11	3	10	4	5	3	28	10
	Fyzabad	5	—	9	1	6	—	5	2	25	3
Rohilcund	Bareilly	—	—	4	1	4	1	2	—	10	2
	Moradabad	—	—	1	—	1	—	—	—	2	—
	Ranikhet	3	1	4	—	1	—	3	—	11	1
	Choubuttia	—	—	6	2	4	—	—	—	10	2
	Naini Tal	—	—	3	—	2	1	—	—	5	1
Saugor	Jubbulpore	5	1	2	—	2	—	2	1	11	2
	Saugor	—	—	—	—	1	—	2	—	3	—
Gwalior	Morar	—	—	9	2	16	7	5	2	30	11
	Fortress Gwalior.	—	—	—	—	2	—	2	—	4	—
	Meerut	—	—	10	4	6	2	6	3	22	9
	Agra	1	—	4	1	3	—	—	—	8	1
Meerut	Muttra	—	—	9	3	6	4	1	1	16	8
	Delhi	—	—	3	2	—	—	—	—	3	2
	Roorkee	2	3	2	1	1	—	2	1	7	5

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Meerut—cont.	Landour -	—	—	2	—	—	—	—	—	2	—
	Umballa -	3	—	2	—	1	—	6	2	12	2
	Jullundur -	—	—	—	—	1	—	8	2	9	2
	Subathu -	—	—	—	—	5	1	7	5	12	6
Sirhind -	Dagshai -	—	—	2	—	5	—	3	3	10	3
	Jutogh -	—	—	—	—	—	—	1	—	1	—
	Solon -	—	—	2	1	1	—	—	—	3	1
	Kasauli -	—	—	—	—	3	1	—	—	3	1
	Meean Meer -	1	—	8	1	7	4	2	1	18	6
	Fort Lahore -	3	1	1	—	—	—	1	—	5	1
Lahore -	Ferozepore -	—	—	3	1	2	—	1	—	6	1
	Mooltan -	—	—	2	—	6	2	2	1	10	3
	Dalhousie -	—	—	1	1	—	—	—	—	1	1
	Rawal Pindi -	2	1	9	1	5	5	5	3	21	10
	Fort Attock -	—	—	1	—	—	—	1	—	2	—
	Sialkot -	1	—	1	—	4	—	1	1	7	1
	Campbellpore -	—	—	3	2	1	—	—	—	4	2
Rawal Pindi -	Khyra Gully -	—	—	3	1	3	—	—	—	6	1
	Kalabagh -	—	—	1	—	—	—	—	—	1	—
	Camp Gharial -	—	—	3	—	—	—	—	—	3	—
	„ Topa -	—	—	1	—	1	1	—	—	2	1
	Murree -	—	—	—	—	1	—	—	—	1	—
	Peshawar -	—	—	1	1	7	3	1	1	9	5
Peshawar -	Nowshera -	1	—	—	—	1	—	—	—	2	—
	Cherat -	—	—	7	1	24	6	3	1	34	8
Marching -	Troops on the March.	—	—	1	—	—	—	—	—	1	—
	Camps of Exercise.	—	—	—	—	—	—	2	—	2	—
	Total -	46	7	164	41	184	58	92	36	486	142



**ABSTRACT No. XVIII.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the STATIONS in the BENGAL COMMAND at which the ADMISSIONS and DEATHS from CHOLERA took place in each of the four quarters of the year 1885.**

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency	Fort William	—	—	4	3	1	1	—	—	5	4
	Barrackpore	—	—	1	1	—	—	—	—	1	1
Allahabad	Allahabad	—	—	—	—	6	3	—	—	6	3
	Cawnpore	—	—	1	1	—	—	3	2	4	3
	Dinapore	—	—	2	1	1	—	—	—	3	1
	Benares	—	—	—	—	2	1	1	1	3	2
Oudh	Lucknow	2	—	—	—	3	1	2	—	7	1
	Fyzabad	1	—	—	—	1	—	—	—	2	—
Saugor	Saugor	—	—	—	—	—	—	1	1	1	1
Gwalior	Fortress Gwalior.	—	—	—	—	5	5	—	—	5	5
Meerut	Fatehgarh	—	—	—	—	2	2	—	—	2	2
	Agra	—	—	—	—	4	2	—	—	4	2
	Muttra	—	—	—	—	4	3	—	—	4	3
Sirhind	Kasauli	—	—	—	—	2	—	—	—	2	—
Lahore	Mooltan	—	—	4	3	—	—	—	—	4	3
Rawal Pindi	Rawal Pindi	—	—	—	—	5	4	—	—	5	4
Peshawar	Nowshera	—	—	2	2	—	—	—	—	2	2
Marching	Troops on the March.	—	—	1	—	—	—	—	—	1	—
Total		3	—	15	11	36	22	7	4	61	37

ABSTRACT No. XIX.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the PREVALENCE of DYSENTERY, DIARRHŒA, and HEPATITIS in each of the DIVISIONS in the BENGAL COMMAND during the Year 1885.

Divisions.	Pre- sidency.	Alla- habad.	Oudh.	Rohil- cund.	Saugor.	Gwalior.	Meerut.	Sirhind.	Lahore.	Rawal Pindi.	Peshawar.	March- ing.	Camps of Exercise.		Total.
													Admitted.	Died.	
Strength.	1,949	3,068	3,601	2,221	1,494	1,985	4,847	3,601	2,969	4,313	2,448	1,951	724		35,101
Diseases.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Died.	Admitted.
Dysentery	60	112	115	57	23	75	116	73	56	70	35	42	30	—	864
Diarrhœa	57	167	117	153	74	238	332	200	180	175	183	51	15	—	1,907
Hepatitis and Abscess of Liver.	43	88	79	51	34	41	134	77	49	77	46	12	8	—	728
Total	160	367	311	208	131	354	592	350	285	322	263	105	53	—	3,559

Ratio per 1,000 of Mean Strength.															
Dysentery	30.8	51	31.9	25.7	46	16.1	70	20.3	28	18.9	67	21.5	41.4	—	24.6
Diarrhœa	29.2	54.4	33	71.1	53.0	119.9	73.6	55.5	60.6	40.6	74.7	26.1	20.7	—	56.1
Hepatitis and Abscess of Liver.	22.1	51	21.9	23.0	1.80	20.6	25.6	21.4	56	17.9	46	6.2	11.1	—	20.7
Total	82.1	1.02	86.3	119.8	92.0	178.3	122.1	97.2	98.0	74.7	92	53.8	73.2	—	101.4

ABSTRACT No. XX.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the PREVALENCE and MORTALITY in the Cantonments of the BENGAL COMMAND, due to DYSENTERY, DIARRHŒA, and HEPATITIS, in each Quarter of the Year 1835.

	Strength.	Dysentery.				Diarrhœa.				Hepatitis (including Abscess of Liver).				Total.			
		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.		Number.		Ratio per 1,000 of Strength.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st Quarter	- 33,857	113	1	3.3	.03	245	—	7.3	—	150	11	4.4	.32	508	12	15.0	.35
2nd "	- 36,034	220	5	6.1	.14	604	—	16.8	—	192	4	5.3	.11	1,016	9	28.2	.25
3rd "	- 35,832	261	3	7.3	.08	728	1	20.3	.03	228	6	6.4	.17	1,217	10	34.0	.28
4th "	- 34,644	263	3	7.6	.09	387	—	11.2	—	170	10	4.9	.29	820	13	23.7	.38
Total	- 35,092	857	12	24.4	.34	1,964	1	56.0	.03	740	31	21.1	.88	3,561	44	101.5	1.25



ABSTRACT No. XXII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed at MADRAS during the year 1885, with the Ratios per

Orders.	Average Strength, 10,414.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	<b>I.—General Diseases.</b>							
	<i>Febrile Group.</i>							
	Eruptive Fevers { Small-pox -	6	—	—	—	—	—	·52
	{ Other -	5	—	—	—	—	—	·24
	Continued " { Enteric -	73	23	—	23	1	—	9·79
	{ Other -	784	—	—	—	—	—	26·52
	Paroxysmal Fevers -	763	2	—	2	1	1	24·44
	Cholera -	6	2	—	2	—	—	·25
	Other diseases -	12	—	—	—	—	—	·78
	Total -	1,649	27	—	27	2	1	62·54
	<i>Constitutional Group.</i>							
	Rheumatism -	304	1	—	1	7	3	19·72
	Primary Syphilis -	1,284	—	—	—	—	—	94·83
	Secondary " -	221	2	—	2	17	8	20·59
	Tubercular diseases -	79	9	3	12	20	20	12·39
	Scurvy and Purpura -	—	—	—	—	—	—	—
	Other diseases -	19	1	1	2	1	—	1·54
	Total -	1,907	13	4	17	45	31	149·07
	<b>II.—Local Diseases.</b>							
	<i>Diseases of the—</i>							
1	Nervous System -	163	9	—	9	32	21	13·44
2	Eye -	150	—	—	—	11	6	6·67
3	Ear -	170	—	—	—	7	6	8·55
4	Nose -	9	—	—	—	—	—	·20
5	Circulatory System -	100	7	1	8	24	19	8·66
6	Absorbent " -	359	—	—	—	2	—	43·73
7	Ductless Glands -	—	—	—	—	—	—	—
8	Respiratory System -	345	4	—	4	8	5	17·66
9	Digestive " -	2,424	19	—	19	60	12	118·66
10	Urinary { Gonorrhœa -	1,432	—	—	—	—	—	105·00
	System { Sequelæ of Gonorrh. -	214	—	—	—	1	1	13·66
	{ Other diseases -	146	—	—	—	2	1	5·28
11	Generative System -	141	—	—	—	1	2	7·28
12	Organs of Locomotion -	78	—	—	—	14	9	7·92
13	Cellular Tissue -	201	—	—	—	—	1	7·21
14	Cutaneous System -	999	—	—	—	1	—	39·37
	<b>III.—Debility</b> -	157	1	—	1	29	21	12·59
	<b>IV.—Poisons</b> -	35	1	—	1	—	—	1·37
	<b>V.—Injuries.</b>							
1	General -	1	7	—	7	—	—	·19
2	Local -	1,380	9	—	9	12	9	54·56
3	In action -	6	—	—	—	—	—	·55
-	No appreciable disease -	39	—	—	—	—	—	1·87
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	General Total -	12,105	97	5	102	251	145	686·02
	Average of 10 years, 1875-84	—	—	—	—	—	—	—

\* The average ratios for 10 years

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000, from 1879 to 1884.				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
·6	—	—	—	·05	·7	·05	—	—	·06
·5	—	—	—	·02	·6	—	—	—	·02
7·0	2·21	·10	—	·94	5·0	1·51	·02	—	·62
75·3	—	—	—	2·55	78·8	·17	·02	—	2·46
73·2	·19	·10	·10	2·35	183·1	·28	—	—	4·99
·6	·19	—	—	·02	1·9	1·12	·41	—	·03
1·1	—	—	—	·07	1·7	·11	—	—	·06
158·3	2·59	·19	·10	6·00	271·8	3·24	·44	—	8·24
29·2	·10	·67	·29	1·89	29·9	·02	1·04	·49	1·57
123·3	—	—	—	9·10	105·2	—	·03	—	8·24
21·2	·19	1·63	·77	1·98	23·5	·05	1·37	·57	2·16
7·6	1·15	1·92	1·92	1·19	6·3	·90	2·19	1·78	·97
—	—	—	—	—	·1	—	—	—	·02
1·8	·19	·10	—	·15	3·2	·09	·43	·08	·27
183·1	1·63	4·32	2·98	14·31	168·2	1·06	5·06	2·92	13·23
15·7	·86	3·07	2·02	1·29	15·3	1·32	3·14	·93	1·07
14·4	—	1·06	·57	·64	14·8	—	·54	·44	·74
16·3	—	·67	·57	·82	11·3	—	·52	·47	·49
·9	—	—	—	·02	·6	—	·03	—	·03
9·6	·77	2·30	1·83	·83	17·9	·68	4·56	2·55	1·47
34·5	—	·19	—	4·20	30·6	—	·08	·02	3·43
—	—	—	—	—	·1	—	—	—	—
33·1	·38	·77	·48	1·70	31·1	·41	·91	·69	1·56
232·8	1·83	5·76	1·15	11·40	238·1	3·23	7·24	1·92	11·61
137·1	—	—	—	10·08	103·3	—	—	—	6·67
20·5	—	·10	·10	1·31	14·5	—	·31	·06	1·00
14·0	—	·19	·10	·51	9·1	·24	·30	·21	·34
13·5	—	·10	·19	·70	14·0	—	·08	·06	·59
7·5	—	1·34	·86	·76	5·6	·05	·57	·39	·43
9·3	—	—	·10	·69	17·7	·03	·17	·03	·77
95·9	—	·10	—	3·78	79·0	—	·22	·19	3·14
15·1	·10	2·79	2·02	1·21	28·3	·05	6·56	2·75	1·74
3·4	·10	—	—	·13	2·9	·17	—	—	·10
·1	·67	—	—	·02	·2	·68	·05	·02	·01
132·5	·86	1·15	·86	5·24	103·9	·71	·90	·76	3·96
·6	—	—	—	·05	—	·02	—	—	—
3·8	—	—	—	·18	2·0	—	—	—	·08
—	—	—	—	—	—	—	—	—	—
1162·4	9·79	24·10	13·93	65·87	1180·3	11·89	31·68	14·41	60·70
1172·7	14·62	37·96	16·24	58·50	—	—	—	—	—

will be given in future years.

ABSTRACT No. XXIII. — TABLE showing the AVERAGE STRENGTH, AVERAGE CONSTANTLY SICK, ADMISSIONS, DEATHS, and INVALIDS at the different STATIONS and CIRCLES in the MADRAS COMMAND, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER.

Divisions.	Stations.	Average Strength.	Average constantly Sick.	Admitted.	Died in and out of Hospital.	Invalidd.	Ratio per 1,000 of Strength.					
							Average constantly Sick.	Admitted.	Died (in and out).	Invalidd.	Average of previous Period of 10 Years.	
											Admitted.	Died.
Eastern District -	Madras and Pallaveram.	666	55	737	3	16	83·84	1123·48	4·57	24·39	1213·19	13·14
	St. Thomas' Mount	282	26	334	4	21	92·20	1184·40	14·18	74·47	1243·13	14·90
	Total	938	81	1,071	7	37	86·35	1141·79	7·46	39·44	—	—
Belgaum and Western District.	Belgaum -	122	5	85	1	—	40·98	696·72	8·20	—	—	—
	Cannanore	764	54	800	9	16	70·68	1047·12	11·78	20·94	1019·19	8·22
	Calicut	117	8	129	2	—	68·38	1102·56	17·09	—	949·95	10·21
	Mallinporam	119	6	102	1	—	50·42	857·14	8·40	—	839·40	11·78
	Total	1,122	73	1,116	13	16	65·06	994·65	11·69	14·26	—	—
Bangalore Division and Ceded Districts.	Bangalore	1,164	62	1,212	4	30	53·26	1041·24	3·44	25·77	1137·89	9·68
	Bellary	961	81	1,385	5	16	84·29	1441·21	5·20	16·65	1452·37	9·59
	Ramandroog	34	—	26	—	—	—	764·71	—	—	—	—
	Total	2,159	143	2,623	9	46	60·23	1214·91	4·17	21·31	—	—
Hyderabad Subsidiary Force.	Secunderabad	2,406	175	2,804	26	63	70·97	1137·06	10·54	25·55	1180·49	12·77
Nagpore Force -	Kamptec	978	53	1,083	2	19	54·19	1107·36	2·04	19·43	1557·42	16·92
	Seetabuldee	54	3	77	1	—	55·55	1425·93	18·52	—	1668·69	8·06
	Total	1,032	56	1,160	3	19	54·26	1124·03	2·91	18·41	—	—

\* Including convalescents and detained.

ABSTRACT No. XXIII.—*continued.*

Divisions.	Stations.		Average Strength.	Average constantly Sick.	Admitted.	Died in and out of Hospital.	Invalided.	Ratio per 1,000 of Strength.					
								Average constantly Sick.	Admitted.	Died (in and out).	Invalided.	Average of previous Period of 10 Years.	
												Admitted.	Died.
British Burmah Division.	Rangoon -	-	825	42	843	9	14	50'91	1021'82	10'91	16'97	1379'89	13'92
	Thayetmyo -	-	667	42	957	10	8	62'97	1434'78	14'99	11'99	1036'43	13'94
	Toungoo -	-	401	49	586	6	1	72'32	1461'35	14'96	2'49	1091'57	13'18
	Port Blair	-	139	5	111	1	—	35'97	798'56	7'19	—	918'41	7'49
	Thaudoungce	-	9	5	8	—	—	555'55	888'89	—	—	—	—
	Allanmyo -	-	10	1	15	—	—	100'00	1500'00	—	—	—	—
	Shouyagheen	-	2	—	1	—	—	—	500'00	—	—	—	—
	Total	-	2,053	124	2,521	26	23	60'40	1227'96	12'66	11'20	—	—
Depôts	Poonamallee	-	118	33	226	6	35	279'66	1915'25	50'85	296'61	2016'37	47'23
	Wellington	-	368	45	516	5	12	122'28	1402'17	13'59	32'61	1140'20	13'96
	Total	-	486	78	742	11	47	160'40	1526'75	22'63	96'71	—	—
	On the march	-	158	1	86	2	—	6'33	430'38	12'66	—	533'10	51'93

\* Including convalescents and detained.



ABSTRACT No. XXIV.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL in each of the MILITARY DIVISIONS in the MADRAS

Orders.	Military Divisions.	Eastern District.		Belgaum and Western District.		Bangalore Division and Ceded Districts.		Hyderabad Subsidiary Force.		Nagpore Force.		British Burmah Division.		Depôts.		On the March.		Total.	
		932		1,122		2,159		2,406		1,032		2,053		486		153		10,414	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Average Strength -																		
	Diseases.																		
	<b>I. General Diseases.</b>																		
	<i>Febrile group—</i>																		
	Eruptive { Small-Pox -	—	—	1	—	2	—	—	—	3	—	—	—	—	—	—	—	6	—
	Fevers { Other -	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—
	Continued { Enteric -	1	1	3	4	26	3	29	10	4	1	2	—	3	2	—	—	73	23
	Fevers { Other -	55	—	67	—	193	—	216	—	21	—	215	—	13	—	—	—	784	—
	Paroxysmal Fevers -	33	—	12	—	21	—	98	1	358	—	214	1	21	—	—	—	763	—
	Cholera -	—	—	—	—	—	—	4	1	—	—	1	—	—	—	—	—	6	—
	Other Diseases -	—	—	3	—	2	—	3	—	1	—	4	—	—	—	—	—	12	—
	Total of Febrile group -	89	1	87	4	244	3	350	12	388	1	443	4	38	2	10	—	1,649	27
	<i>Constitutional group—</i>																		
	Rheumatism -	20	—	17	—	54	—	104	1	17	—	71	—	21	—	—	—	304	1
	Primary syphilis -	164	—	144	—	455	—	154	—	29	—	194	—	126	—	—	—	1,284	—
	Secondary -	29	1	32	—	61	—	33	—	4	—	29	1	32	—	1	—	221	2
	Tubercular diseases -	7	2	2	—	18	—	18	1	6	—	11	4	17	2	—	—	79	9
	Scurvy and Purpura -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Other Diseases -	—	—	7	—	2	—	4	—	1	—	2	—	3	1	—	—	19	1
	Total of constitutional group -	220	3	202	—	590	—	313	2	57	—	307	5	199	3	19	—	1,907	13
	<b>II. Local Diseases.</b>																		
	<i>Diseases of the—</i>																		
1	Nervous System -	7	1	18	—	27	1	66	3	4	—	29	4	12	—	—	—	163	9
2	Eye -	7	—	12	—	38	—	47	—	17	—	20	—	8	—	1	—	150	—
3	Ear -	18	—	18	—	16	—	40	—	15	—	42	—	21	—	—	—	170	—
4	Nose -	—	—	—	—	3	—	5	—	1	—	—	—	—	—	—	—	9	—
5	Circulatory System	8	—	22	2	11	1	33	2	1	—	17	1	7	—	1	1	100	7
6	Absorbent -	42	—	41	—	123	—	33	—	26	—	52	—	34	—	6	—	359	—
7	Ductless Glands -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8	Respiratory System	33	—	28	1	62	1	66	—	7	—	127	—	24	2	—	—	345	4
9	Digestive -	167	2	266	1	459	3	661	5	104	1	597	4	109	2	11	1	2,424	19
10	Urinary { Gonorrhœa -	152	—	93	—	328	—	402	—	177	—	193	—	76	—	11	—	1,432	—
	System { Sequelæ of Gonorr. -	17	—	21	—	44	—	51	—	45	—	30	—	7	—	—	—	214	—
	Other diseases -	17	—	10	—	32	—	24	—	29	—	25	—	8	—	—	—	146	—
11	Generative System	15	—	12	—	32	—	33	—	13	—	26	—	9	—	1	—	141	—
12	Organs of Locomotion -	5	—	5	—	17	—	32	—	2	—	9	—	8	—	—	—	78	—
13	Cellular Tissue -	21	—	42	—	61	—	40	—	7	—	33	—	6	—	1	—	201	—
14	Cutaneous System	147	—	110	—	189	—	201	—	80	—	229	—	43	—	—	—	999	—
	<b>III. Debility</b>	15	—	11	—	28	—	43	—	8	—	29	—	23	1	—	—	157	1
	<b>IV. Poisons</b>	2	—	4	—	13	—	7	1	1	—	8	—	—	—	—	—	35	1
	<b>V. Injuries.</b>																		
1	General -	—	—	—	4	1	—	—	—	—	—	—	2	—	1	—	—	1	7
2	Local -	84	—	109	1	292	—	365	1	180	1	298	6	47	—	5	—	1,380	9
3	In action -	—	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—
	No appreciable Disease -	5	—	1	—	23	—	2	—	—	—	7	—	1	—	—	—	39	—
	Cause unknown -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	<b>General Total</b>	1,071	7	1,118	13	2,623	9	2,804	26	1,160	3	2,521	26	742	11	68	2	12,105	97

OFFICER, showing the PREVALENCE and MORTALITY of the different Classes of DISEASES  
COMMAND, for the year 1885, with the Ratios per 1,000 of the Strength.

Eastern District.	Belgaum and Western District.	Bangalore Division and Ceded Districts.	Hyderabad Subsidiary Force.	Nagpore Force.	British Burmah Division.	Depôts.	On the March.	Total.									
Ratio per 1,000 of Mean Strength.																	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	—	89	—	93	—	—	—	58	—	—	—	—	—	—	—	—	—
1'07	1'07	2'67	3'57	12'04	1'39	11'76	4'05	2'91	—	—	—	2'06	—	—	—	48	—
58'64	—	59'71	—	89'39	—	87'59	—	3'88	97	3'41	97	6'17	4'11	—	—	7'01	2'21
35'18	—	10'70	—	9'73	—	39'74	41	20'35	—	104'73	—	26'75	—	25'32	—	75'28	—
—	—	—	—	—	—	1'62	40	346'90	—	104'24	40	43'21	—	37'07	—	73'26	19
—	—	2'67	—	93	—	1'22	—	97	—	1'95	40	—	—	—	—	58	19
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1'15	—
04'88	1'07	77'54	3'57	113'08	1'39	141'93	4'86	375'97	97	215'78	1'95	78'19	4'11	63'29	—	158'34	2'59
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21'32	—	15'15	—	25'01	—	48'17	41	16'47	—	34'58	—	43'21	—	—	—	29'19	10
174'84	—	128'34	—	210'75	—	62'45	—	28'10	—	94'50	—	259'26	—	113'92	—	123'30	—
30'92	1'07	28'52	—	28'25	—	13'38	—	3'88	—	14'13	40	65'84	—	6'33	—	21'22	19
7'46	2'13	1'78	—	8'34	—	7'30	40	5'81	—	5'36	1'95	34'98	4'11	—	—	7'58	86
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	6'24	—	93	—	1'62	—	97	—	97	—	6'17	2'06	—	—	1'88	10
234'54	3'20	180'04	—	273'28	—	126'93	81	55'23	—	149'54	2'44	409'46	6'17	120'25	—	183'12	1'25
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7'46	1'07	16'04	—	13'51	46	26'76	1'22	3'88	—	14'13	1'95	24'69	—	—	—	15'65	86
7'46	—	10'70	—	17'60	—	19'08	—	16'47	—	9'74	—	16'46	—	6'33	—	14'40	—
19'19	—	16'04	—	7'41	—	16'22	—	14'53	—	20'46	—	43'21	—	—	—	16'33	—
—	—	—	—	1'39	—	2'03	—	97	—	—	—	—	—	—	—	86	—
8'53	—	19'61	1'78	5'09	46	13'38	81	97	—	8'28	49	14'40	—	6'33	6'33	9'60	67
44'78	—	36'54	—	56'97	—	13'38	—	25'19	—	25'33	—	74'07	—	37'97	—	34'47	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35'18	—	23'17	89	28'72	46	26'76	—	6'78	—	61'86	—	49'38	4'11	—	—	33'13	38
178'04	2'13	237'08	89	212'60	1'39	263'99	2'03	100'77	97	290'79	1'95	347'74	4'11	69'62	6'33	232'76	1'83
162'05	—	82'89	—	151'92	—	163'02	—	171'51	—	94'01	—	156'38	—	69'62	—	137'51	—
18'13	—	18'72	—	20'38	—	20'68	—	41'07	—	14'61	—	14'40	—	6'33	—	20'56	—
18'12	—	8'91	—	14'82	—	9'73	—	28'10	—	12'18	—	16'46	—	6'33	—	14'02	—
15'99	—	10'70	—	14'82	—	13'38	—	12'60	—	12'66	—	18'52	—	6'33	—	13'54	—
5'33	—	4'46	—	7'87	—	12'98	—	1'94	—	4'38	—	16'46	—	—	—	7'49	—
22'39	—	37'43	—	23'62	—	16'22	—	6'78	—	16'07	—	12'33	—	6'33	—	19'30	—
156'72	—	98'04	—	87'54	—	81'51	—	77'62	—	111'54	—	88'48	—	—	—	95'93	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15'99	—	9'80	—	12'97	—	17'44	—	7'75	—	14'13	—	47'33	2'06	—	—	15'08	10
2'13	—	3'57	—	6'02	—	2'84	40	97	—	3'90	—	—	—	—	—	3'36	10
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
89'55	—	97'15	357	0'46	—	—	—	—	—	97	—	2'06	—	—	—	10	67
—	—	5'35	89	135'25	—	148'01	41	174'42	97	145'15	2'92	96'71	—	31'65	—	132'51	86
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	58	—
5'33	—	89	—	10'65	—	81	—	—	—	3'41	—	2'06	—	—	—	3'75	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1141'79	7'46	994'65	11'59	1214'91	4'16	1137'06	10'54	1124'03	2'91	1227'96	12'66	1526'75	22'63	439'38	12'66	1162'38	9'31

**ABSTRACT No. XXV.**—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the STATIONS in the MADRAS COMMAND at which the ADMISSIONS and DEATHS from ENTERIC FEVER took place in each of the four quarters of the year 1885.

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Eastern District -	St. Thomas' Mount.	—	—	—	—	1	1	—	—	1	1
Belgaum and Western District -	Belgaum -	—	—	—	—	—	—	1	—	1	—
	Cannanore -	1	2	—	—	—	—	—	—	1	2
	Calicut -	—	—	—	—	—	—	1	1	1	1
Bangalore Division and Ceded District -	Malliaporam -	1	—	—	—	—	—	—	—	1	—
	Bangalore -	8	1	6	—	4	—	—	—	18	1
	Bellary -	2	1	1	—	1	—	4	1	8	2
Hyderabad Subsidiary Force.	Wellington -	—	—	3	2	—	—	—	—	3	2
	Secunderabad -	7	3	2	—	11	4	9	3	29	10
Nagpore Force -	Kamptee -	—	—	1	—	2	—	—	—	3	—
	Seetabuldee -	1	—	—	1	—	—	—	—	1	1
British Burmah Division -	Rangoon -	—	—	—	—	1	1	—	—	1	1
	Thayetnyo -	1	1	—	—	—	—	—	—	1	1
	Toungoo -	—	—	—	—	1	—	—	—	1	—
	Port Blair -	4	—	—	—	—	—	—	—	4	—
Total -		25	8	13	3	21	6	14	6	73	23

**ABSTRACT No. XXVI.**—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the STATIONS in the MADRAS COMMAND at which the ADMISSIONS and DEATHS from CHOLERA took place in each of the four quarters of the year 1885.

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Hyderabad Subsidiary Force.	Secunderabad	1	—	1	—	2	1	—	—	4	1
Nagpore Force -	Kamptee -	—	—	—	—	1	—	—	—	1	—
British Burmah Division.	Toungoo -	—	—	—	—	1	1	—	—	1	1
Total -		1	—	1	—	4	2	—	—	6	2

ABSTRACT No. XXVII.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the prevalence of DYSENTERY, DIARRHOEA, and HEPATITIS in each of the DIVISIONS in the MADRAS COMMAND for 1885.

Circles.	Eastern District.	Belgaum and Western District.		Bangalore Division and Ceded Districts.		Hyderabad Subsidiary Force.		Nagpore Force.		British Burmah Division.		On the March.		Total.
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
Strength.	1,056	1,122	2,527	2,466	1,032	2,053	158	10,414						
Diseases.														
Dysentery -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diarrhea -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis and Abscess of Liver -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total -	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Ratio per 1,000 of Strength.														
Dysentery -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diarrhea -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis and Abscess of Liver -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total -	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ABSTRACT No. XXVIII.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the PREVALENCE and MORTALITY in the MADRAS COMMAND, due to DYSENTERY, DIARRHŒA, and HEPATITIS, in each Quarter of the Year 1885.

	Strength.	Dysentery.				Diarrhœa.				Hepatitis (including Abscess of the Liver).				Total.			
		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st Quarter	- 10,702	130	1	12.15	0.09	110	—	10.28	—	82	2	7.66	0.19	322	3	30.09	0.28
2nd "	- 10,429	101	—	9.68	—	129	—	12.37	—	72	2	6.90	0.19	302	2	28.95	0.19
3rd "	- 10,440	201	2	19.25	0.19	117	—	11.21	—	84	6	8.04	0.57	402	8	38.50	0.76
4th "	- 10,084	185	1	18.39	0.10	74	—	7.34	—	69	3	6.84	0.20	278	3	27.57	0.30
Total for the Year	10,414*	567	4	54.45	0.38	430	—	41.29	—	307	12	29.48	1.15	1,304	16	125.22	1.53

\* Average annual strength.

---

ABSTRACT XXIX.

---

ABSTRACT No. XXIX.—The following TABLE, taken from the REPORT of the  
and INVALIDING for the YEAR under

Years.	Average Strength.			Number of Deaths.		
	Commissioned Off- cers.	Non-commissioned Officers.	Privates.	Commissioned Off- cers.	Non-commissioned Officers.	Privates.
1875 - - -	398	1,698	9,779	11	32	131
1876 - - -	405	1,670	9,671	7	31	143
1877 - - -	454	1,700	9,641	6	46	142
1878 - - -	442	1,665	9,491	9	55	178
1879 - - -	433	1,660	9,744	3	33	140
1880 - - -	473	1,611	9,503	5	8	92
1881 - - -	425	1,555	9,108	4	21	93
1882 - - -	525	1,205	10,001	3	19	95
1883 - - -	388	1,213	9,426	3	28	80
1884 - - -	375	1,268	9,682	4	20	73
Average for 10 years -	432	1,524	9,605	5	29	117
1885 - - -	389	1,245	9,656	3	23	74

PRINCIPAL MEDICAL OFFICER of MADRAS, shows the comparative MORTALITY REPORT and for the TEN previous YEARS.

Invalided.			Ratio per 1,000 of Strength.					
Commissioned Officers.	Non-commissioned Officers.	Privates.	Deaths.			Invalids.		
			Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.
38	61	532	27·64	18·84	13·39	95·48	35·92	54·39
34	65	413	17·28	18·56	14·79	83·95	38·92	42·70
33	63	447	13·22	27·05	14·78	72·69	37·59	46·35
29	57	441	20·36	33·03	18·75	65·61	34·23	46·44
26	62	405	6·93	19·88	14·36	60·05	37·35	41·56
40	12	226	10·57	4·96	9·68	84·56	7·45	23·78
24	33	253	9·41	13·51	10·21	56·47	21·22	27·78
27	44	277	5·71	15·77	9·49	51·43	36·51	27·70
26	48	299	7·73	23·08	8·48	67·01	39·57	31·72
25	60	290	10·66	15·77	7·54	66·67	47·32	29·95
30	50	358	12·74	19·22	12·15	69·94	33·13	37·31
20	52	199	7·71	18·47	7·66	51·41	41·78	20·61



ABSTRACT No. XXX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS  
TROOPS stationed in BOMBAY during the Year 1885, with the Ratios

Orders.	Average Strength, 11,650.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	<b>I.—General Diseases.</b>							
	<i>Febrile Group.</i>							
	Eruptive Fevers { Small-pox	1	—	—	—	—	—	·18
	Other	8	1	—	1	—	—	·54
	Continued „ { Enteric	88	30	—	30	—	—	9·63
	Other	1,326	4	—	4	3	—	43·14
	Yellow Fever	—	—	—	—	—	—	—
	Paroxysmal Fevers	5,246	12	—	12	10	—	166·59
	Cholera	131	85	—	85	—	—	2·77
	Other diseases	25	—	—	—	2	—	1·34
	Total	6,825	132	—	132	15	—	224·19
	<i>Constitutional Group.</i>							
	Rheumatism	318	—	—	—	12	2	20·34
	Primary Syphilis	1,150	—	—	—	—	—	78·00
	Secondary „	290	1	—	1	11	4	26·49
	Tubercular diseases	93	12	3	15	22	19	12·50
	Scurvy and Purpura	31	—	—	—	1	—	2·11
	Other diseases	60	3	—	3	9	1	4·58
	Total	1,942	16	3	19	55	26	144·02
	<b>II.—Local Diseases.</b>							
	<i>Diseases of the—</i>							
1	Nervous System	242	17	1	18	35	21	17·25
2	Eye	146	—	—	—	6	8	7·46
3	Ear	140	—	—	—	9	8	7·19
4	Nose	6	—	—	—	—	—	·20
5	Circulatory System	183	3	—	3	34	26	15·05
6	Absorbent „	164	—	—	—	2	—	17·23
7	Ductless Glands	—	—	—	—	—	—	—
8	Respiratory System	476	22	1	23	3	4	24·84
9	Digestive „	2,249	57	2	59	58	6	93·06
10	Urinary { Gonorrhœa	1,146	—	—	—	—	—	72·55
	System { Sequelæ of Gonorr.	240	2	—	2	2	—	14·08
	Other diseases	142	1	—	1	9	8	7·32
11	Generative System	117	—	—	—	1	—	6·74
12	Organs of Locomotion	76	1	1	2	12	5	5·50
13	Cellular Tissue	206	—	—	—	1	—	7·32
14	Cutaneous System	784	—	—	—	3	1	31·71
	III.—Debility	403	8	—	3	78	15	25·03
	IV.—Poisons	115	7	—	7	—	—	2·99
	<b>V.—Injuries.</b>							
1	General	4	5	—	5	—	—	·67
2	Local	1,382	14	—	14	15	12	54·89
3	In action	—	—	—	—	—	—	—
	No appreciable disease	17	—	—	—	—	—	1·27
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	General Total	17,005	280	8	288	338	140	780·56
	Average for 10 years, 1875–84	—	—	—	—	—	—	—

\* The average ratios for 10 years

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the per 1,000 of the Strength, and the Average Ratios for 10 Years.\*

Ratio per 1,000.					Average Ratio per 1,000, from 1879 to 1884.				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
.1	—	—	—	.01	.4	.05	—	—	} .07 8.74
.7	.09	—	—	.05	.7	—	—	—	
7.6	2.57	—	—	.88	5.2	2.04	.08	—	
113.8	.34	.26	—	3.70	113.4	.28	.07	—	
—	—	—	—	—	—	—	—	—	—
450.3	1.03	.86	—	14.30	643.2	1.65	6.36	.03	15.45
11.2	7.30	—	—	.24	1.6	1.21	—	—	.02
2.1	—	.17	—	.11	4.4	.18	—	.02	.19
585.8	11.32	1.29	—	19.24	768.9	5.41	6.50	.05	19.47
27.3	—	1.03	.17	1.75	33.5	.11	1.57	.39	1.76
98.7	—	—	—	6.70	84.2	.02	—	—	5.87
24.9	.09	.94	.34	2.27	21.8	—	1.36	.56	1.63
8.0	1.29	1.89	1.63	1.07	7.4	1.18	2.71	1.90	.75
2.7	—	.09	—	.18	1.4	.02	.02	—	.06
5.1	.26	.77	.09	.39	3.8	.18	.48	.21	.27
166.7	1.64	4.72	2.23	12.36	152.1	1.50	6.13	3.06	10.34
20.8	1.55	3.00	1.80	1.48	15.8	1.78	2.78	.78	1.05
12.5	—	.51	.69	.64	14.8	—	.57	.70	.79
12.0	—	.77	.69	.62	10.6	—	.51	.60	.47
.5	—	—	—	.02	.7	—	—	—	.04
15.7	.26	2.92	2.23	1.29	16.8	.62	4.25	3.14	1.39
14.1	—	.17	—	1.48	19.6	—	.03	—	1.57
—	—	—	—	—	.1	—	.02	.02	.04
40.9	1.97	.26	.34	2.13	49.8	1.55	1.20	.82	2.34
193.0	5.06	4.98	.51	7.99	211.2	3.33	6.29	1.63	8.01
98.4	—	—	—	6.23	101.7	—	—	—	6.08
20.6	.17	.17	—	1.21	17.9	—	.16	.07	1.12
12.2	.09	.77	.69	.63	10.1	.23	.46	.20	.53
10.0	—	.09	—	.58	10.1	—	.16	.16	.47
6.5	.17	1.03	.43	.47	5.0	.07	.70	.54	.32
17.7	—	.09	—	.63	17.8	.02	.07	.05	.79
67.3	—	.26	.09	2.72	71.1	—	.36	.23	2.77
34.6	.26	6.69	1.29	2.15	42.5	.07	12.97	3.04	2.21
9.9	.60	—	—	.25	6.2	.15	—	—	.15
.3	.43	—	—	.06	.5	.70	.02	—	.03
118.6	1.20	1.29	1.03	4.71	105.0	.90	1.05	.75	3.78
—	—	—	—	—	.2	—	.15	—	.01
1.5	—	—	—	.11	1.4	—	—	—	.05
—	—	—	—	—	—	—	—	—	—
1459.6	24.72	29.01	12.02	67.00	1649.9	16.32	44.37	15.84	63.82
1569.6	16.82	48.01	16.51	61.71	—	—	—	—	—

will be given in future years.

ABSTRACT No. XXXI.—The following TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, shows the ADMISSIONS and DEATHS in the PRINCIPAL STATIONS in the BOMBAY COMMAND.

Adminis- trative Circles.	Stations.	Average Annual Strength.	Number of Admis- sions.	Number of Deaths.	Ratio per 1,000 of the Strength.			
					Admissions.	Deaths.	Average of 10 Years, 1875-84.	
							Admis- sions.	Deaths.
Presidency	Colaba	- 733	737	10	1005·5	13·64	1846·8	16·20
	Deolalee	- 365	530	7	1452·1	19·18	1331·8	20·15
	Belgaum	- 776	668	7	860·8	9·02	1165·6	8·39
	Aden	- 774	901	12	1164·1	15·50	933·6	13·51
Sind	Karachi	- 818	1,376	18	1682·2	22·00	1962·8	19·05
	Hyderabad	- 413	907	4	2196·1	9·69	1610·8	11·70
Poona	Poona	- 1,128	1,533	14	1359·0	12·41	1578·3	11·92
	Kirkee	- 527	689	8	1307·4	15·18	1550·3	12·45
	Ahmednagar	- 459	683	1	1488·0	2·18	1694·8	14·31
	Satara	- 128	162	1	1265·2	7·81	1573·9	6·68
	Kholapur	- 53	79	1	1519·2	19·23	1342·2	12·57
Mhow	Mhow	- 1,274	1,598	13	1254·8	10·20	1845·9	10·44
	Nasæerabad	- 646	946	7	1464·4	10·84	1752·5	24·17
	Neemuch	- 347	746	6	2149·9	17·29	2267·7	20·23
	Asirgurh	- 123	222	1	1804·9	8·13	1753·1	14·89
	Indore	- 94	184	3	1957·4	31·91	2042·4	15·37
	Ahmedabad	- 245	434	2	1771·4	8·16	1858·5	13·97
	Deesa	- 417	437	10	1048·0	23·98	1311·1	12·35
	Khundwa	- 2	3	2	1500·0	1000·00	—	—
Quetta	Quetta	- 1,619	3,572	138	2206·3	85·23	*1471·2	*25·67
	Sanitaria	- 182	313	6	1719·8	32·97	2006·2	27·67
	On March	- 528	285	9	539·8	17·05	810·8	21·81
	Total	- 11650	17005	280	1459·5	24·03	—	—

\* For two years only.

---

ABSTRACT XXXII.

---

ABSTRACT No. XXXII.—TABLE taken from the REPORT of the PRINCIPAL MEDICAL  
of DISEASES in each of the ADMINISTRATIVE CIRCLES in the BOMBAY

Orders.	Military Divisions	Presi- dency.		Sind.		Poona.		Mhow.		Quetta.		Sanitaria		Troops on March.		Total.	
		Average Strength		1,231		2,294		3,148		1,619		182		528		11,650	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	<b>I. General Diseases.</b>																
	<i>Febrile Group.</i>																
	Eruptive { Small-pox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
	Fevers { Other	2	—	—	—	1	—	4	—	1	—	1	—	—	—	8	—
	Continued { Enteric	11	5	19	4	9	5	32	12	14	4	3	—	—	—	88	30
	Fevers { Other	291	1	406	—	381	3	132	—	92	—	19	—	5	—	1,326	4
	Paroxysmal Fevers	374	—	696	—	791	—	1,338	3	1,907	7	76	1	64	1	5,246	12
	Cholera	2	2	2	1	—	—	10	7	115	73	—	—	2	2	131	85
	Other diseases	6	—	—	—	2	—	6	—	7	—	—	—	4	—	25	—
	Total of Febrile group	686	8	1,123	5	1,184	8	1,522	22	2,136	85	99	1	75	3	6,825	132
	<i>Constitutional Group.</i>																
	Rheumatism	66	—	16	—	47	—	100	—	73	—	9	—	7	—	318	—
	Primary Syphilis	187	—	116	—	199	—	479	—	119	—	16	—	34	—	1,150	—
	Secondary	45	—	43	—	66	—	72	—	41	—	18	—	5	1	290	—
	Tubercular diseases	36	5	3	2	17	1	20	2	11	2	4	—	—	—	93	12
	Scurvy and Purpura	3	—	4	—	15	—	2	—	5	—	2	—	—	—	31	—
	Other diseases	7	1	4	1	8	—	8	—	29	—	4	1	—	—	60	3
	Total of Constitu- tional Group.	344	6	186	3	352	1	681	2	278	2	53	1	48	1	1,942	16
	<b>II. Local Diseases.</b>																
	Diseases of the—																
1	Nervous System	99	4	19	5	32	2	62	5	18	1	7	—	5	—	242	17
2	Eye	30	—	15	—	48	—	32	—	11	—	6	—	4	—	146	—
3	Ear	30	—	40	—	22	—	38	—	8	—	2	—	—	—	140	—
4	Nose	—	—	—	—	2	—	2	—	2	—	—	—	—	—	6	—
5	Circulatory System	102	1	11	—	24	1	24	1	14	—	4	—	4	—	183	3
6	Absorbent	40	—	17	—	24	—	50	—	19	—	1	—	4	—	164	—
7	Ductless Glands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8	Respiratory System	66	4	62	1	69	—	102	3	161	12	5	—	11	2	476	22
9	Digestive	384	5	251	6	423	7	595	3	504	32	49	3	43	1	2,249	57
10	Urinary { Gonorrhoea	273	—	91	—	300	—	371	—	59	—	11	—	41	—	1,146	—
	Sequels of Gon.	54	1	20	—	56	—	96	—	12	1	2	—	—	—	240	2
	System. { Other diseases	34	—	6	—	28	—	66	1	7	—	1	—	—	—	142	1
11	Generative System	29	—	8	—	17	—	49	—	8	—	4	—	2	—	117	—
12	Organs of Locomotion	19	—	1	—	18	1	20	—	11	—	7	—	—	—	76	1
13	Cellular Tissue	38	—	36	—	40	—	64	—	23	—	3	—	2	—	206	—
14	Cutaneous System	182	—	154	—	143	—	231	—	61	—	7	—	6	—	784	—
	<b>III. Debility</b>	98	—	56	—	64	—	66	—	78	2	33	—	9	1	403	3
	<b>IV. Poisons</b>	41	2	10	—	18	1	18	3	21	1	6	—	1	—	115	7
	<b>V. Injuries.</b>																
1	General	1	2	1	—	1	1	—	—	1	1	—	—	—	1	4	5
2	Local	274	3	173	2	278	3	473	4	140	1	14	1	30	—	1,382	14
3	In action	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	No appreciable disease - Cause unknown (refers to deaths only).	3	—	3	—	3	—	8	—	—	—	—	—	—	—	17	—
	Total	2,836	36	2,283	22	3,146	25	4,570	44	3,572	138	313	6	285	9	17,005	280

OFFICER, showing the PREVALENCE and MORTALITY of the Different Classes  
COMMAND, with the Ratios per 1,000 of the Strength.

Presidency.	Sind.	Poona.	Mhow.	Quetta.	Sanitaria.	Troops on March.	Total.
Ratio per 1,000 of mean Strength.							
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
— 4.1 109.9 141.2 — 2.3	— 1.89 — — — —	— 15.4 329.8 565.4 — —	— 3.25 — — — —	— 3.9 166.1 344.8 — —	— 2.18 1.31 — — —	— 1.3 10.2 41.9 — — —	— 3.81 — — — — —
259.1	3.02	912.3	4.06	516.1	3.49	483.5	6.99
24.9 70.6 17.0 13.6 1.1 2.6	— — — 1.89 — — —	13.0 94.2 34.9 2.4 3.2 3.2	— — — 1.62 — — —	20.5 86.7 28.8 7.4 6.5 3.0	— — — — — — —	31.8 152.2 22.9 6.4 — 2.5	— — — — — — —
129.9	2.27	151.1	2.44	153.0	.44	216.3	.64
37.4 11.3 11.3 — 38.5 18.5 — 24.9 145.0 108.1 20.4 12.8 11.0 7.2 14.3 68.7	1.51 — — — — — — — — — — — — — — — —	15.4 12.2 32.5 — — — — — — — — — — — — — —	4.06 — — — — — — — — — — — — — — — —	13.9 20.9 9.6 — — — — — — — — — — — — —	.87 — — — — — — — — — — — — — — — —	19.7 10.2 12.1 — — — — — — — — — — — — — —	1.59 — — — — — — — — — — — — — — — —
37.0	—	45.5	—	27.9	—	21.0	—
15.5	.76	8.1	—	7.8	.44	5.7	.95
108.5	.76 1.13	140.5 —	1.62 —	121.2 —	1.31 —	150.2 —	1.27 —
1.1	—	2.4	—	1.3	—	2.5	—
1071.0	13.80	1854.6	17.87	1371.4	10.90	1451.7	13.96

**ABSTRACT No. XXXIII.—TABLE taken from the REPORT of the PRINCIPAL MEDICAL OFFICER showing the STATIONS in the BOMBAY COMMAND at which the ADMISSIONS and DEATHS from ENTERIC FEVER took place in each of the four quarters of the Year 1885.**

Circles.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Presidency	Colaba	1	1	—	—	—	—	—	—	1	1
	Deolalee	1	—	—	—	1	—	1	—	3	—
	Belgaum	1	1	2	—	4	3	—	—	7	4
Sind	Karachi	7	—	5	1	—	—	7	3	19	4
Poona	Poona	—	—	7	4	1	1	—	—	8	5
	Ahmednagar	—	—	—	—	—	—	1	—	1	—
Mhow	Mhow	—	—	2	2	3	1	—	—	5	3
	Nasirabad	5	2	1	1	4	—	—	1	10	4
	Neemuch	—	—	—	—	—	—	1	—	1	—
	Asirgarh	—	—	—	—	—	—	1	—	1	—
	Indore	—	—	—	—	1	1	—	—	1	1
	Taragarh	—	—	—	—	3	—	—	—	3	—
	Deesa	6	2	5	1	—	—	3	1	14	4
Quetta	Quetta	—	—	—	—	11	3	3	1	14	4
Total		21	6	23	9	28	9	17	6	88	30

**ABSTRACT No. XXXIV.—TABLE taken from the REPORT of the PRINCIPAL MEDICAL OFFICER showing the STATIONS in the BOMBAY COMMAND at which the ADMISSIONS and DEATHS from CHOLERA took place in each of the four quarters of the Year 1885.**

Circles.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Presidency	Deolalee	—	—	—	—	—	—	1	1	1	1
	Belgaum	—	—	—	—	1	1	—	—	1	1
Sind	Karachi	—	—	1	1	—	—	1	—	2	1
Mhow	Mhow	—	—	3	2	—	—	—	—	3	2
	Neemuch	—	—	4	2	—	—	—	—	4	2
	Indore	—	—	1	1	—	—	—	—	1	1
	Khundwa	—	—	—	—	—	—	2	2	2	2
Quetta	Quetta	—	—	46	30	52	33	5	4	103	67
	On the March	—	—	6	3	8	5	—	—	14	8
Total		—	—	61	39	61	39	9	7	131	85

ABSTRACT No. XXXV.—Table taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the PREVALENCE of DYSENTERY, DIARRHŒA, HEPATITIS, and ABSCESS OF LIVER in each CIRCLE in the BOMBAY COMMAND for the Year 1885.

Divisions.	Presidency.		Sind.		Poona.		Mhow.		Quetta.		On March.		Total.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Strength.	2,696		1,218		2,320		3,245		1,210		721		11,410	
Diseases.														
Dysentery -	61	1	41	4	42	2	72	1	85	23	23	2	324	33
Diarrhœa -	59	—	71	—	77	—	143	1	148	1	62	—	560	2
Hepatitis and Abscesses of Liver.	59	—	18	—	53	1	39	3	11	8	6	1	186	8
Total	179	1	130	4	172	3	254	5	244	27	91	3	1,070	43

Ratio per 1,000 of Strength.														
Dysentery -	22·6	·37	33·7	3·28	18·1	·86	22·2	·31	70·2	19·01	31·9	2·77	28·4	2·89
Diarrhœa -	21·9	—	58·3	—	33·2	—	44·1	·31	122·3	·83	86·0	—	49·1	·18
Hepatitis and Abscesses of Liver -	21·9	—	14·8	—	22·8	·43	12·0	·92	9·1	2·48	8·3	1·39	16·3	·70
Total	66·4	·37	106·8	3·28	74·1	1·29	78·3	1·54	201·6	22·32	126·2	4·16	93·8	3·77



ABSTRACT No. XXXVI.—TABLE taken from the REPORT of the PRINCIPAL MEDICAL OFFICER showing the PREVALENCE and MORTALITY in the BOMBAY COMMAND, due to DYSENTERY, DIARRHŒA, HEPATITIS, and ABSCESS OF LIVER in each Quarter of the Year 1885.

Quarters.	Strength.	Dysentery.				Diarrhœa.				Hepatitis and Abscess of Liver.				Total.			
		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.	
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st Quarter	- 10,634	48	1	4.5	.09	64	—	6.0	—	51	—	4.8	—	163	1	15.3	.09
2nd "	- 11,782	54	1	4.6	.08	113	—	9.6	—	43	2	3.6	.17	210	3	17.8	.25
3rd "	- 11,805	115	10	9.9	.86	228	—	19.6	—	48	3	4.1	.26	391	13	33.7	1.12
4th "	- 11,618	107	21	9.2	1.81	155	2	13.3	.17	44	3	3.8	.26	306	26	26.3	2.24
Total for Year -	11,410	324	33	28.4	2.39	560	2	49.1	.18	186	8	16.3	.70	1,070	43	93.7	3.77

---

ABSTRACT XXXVII.

---

**ABSTRACT No. XXXVII.—TABLE taken from the REPORT of the PRINCIPAL INVALIDING in the THREE GRADES of COMMISSIONED OFFICERS, Non-the Ten previous Years.**

Years.	Average Strength.			Number of Deaths.		
	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.
1875 - - -	363	1,163	9,170	7	33	181
1876 - - -	368	1,173	9,111	5	18	110
1877 - - -	375	1,160	8,989	4	13	108
1878 - - -	364	1,316	8,588	3	34	166
1879 - - -	373	1,282	8,502	3	21	136
1880 - - -	336	1,279	7,921	4	42	168
1881 - - -	314	1,213	8,773	5	19	108
1882 - - -	306	1,186	9,011	6	17	89
1883 - - -	339	1,324	9,859	2	18	98
1884 - - -	346	1,345	9,379	5	45	159
Average for 10 years -	348	1,244	8,930	4	26	132
1885 - - -	365	1,551	10,099	6	49	231

**MEDICAL OFFICER at BOMBAY, showing the COMPARATIVE MORTALITY and COMMISSIONED OFFICERS, and PRIVATES for the Year under Report, and for**

Invalided.			Ratio per 1,000.					
Commissioned Officers.	Non-commissioned Officers.	Privates.	Deaths.			Invalids.		
			Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.
33	55	573	11·02	28·37	19·74	90·91	47·29	62·49
43	49	433	13·59	13·59	15·27	116·85	41·56	47·52
35	63	427	10·67	10·67	11·21	93·33	54·31	47·50
44	86	492	8·24	25·84	19·33	120·88	65·35	57·29
20	75	521	8·04	16·38	15·99	53·62	58·50	61·28
21	51	427	10·92	32·83	21·20	57·37	39·87	53·90
22	75	449	15·92	15·66	12·30	70·06	61·83	51·18
15	48	310	19·61	14·38	9·88	49·02	40·47	34·40
21	57	364	5·90	13·59	9·94	61·95	43·05	36·92
34	62	276	14·45	33·45	16·95	98·26	46·10	29·43
29	62	427	11·49	20·90	14·78	83·33	49·84	42·82
25	68	270	16·44	31·59	22·87	68·49	43·84	26·73

ABSTRACT No. XXXVIII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS, TROOPS stationed in EGYPT during the Year 1885, with the

Orders.	Average Strength, 9,593.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average number constantly Sick.
				In the Com- mand.	Of invalids.	Total.	Number sent Home.	Number finally discharged the Service.	
I.—General Diseases.									
Febrile Group.									
		Eruptive Fevers { Small-pox -	52	4	—	4	—	—	4·81
		Other -	7	1	—	1	—	—	·37
		Continued " { Enteric -	497	128	8	136	174	—	47·63
		Other -	1,942	2	—	2	138	—	86·13
		Yellow Fever -	—	—	—	—	—	—	—
		Paroxysmal Fevers -	283	3	1	4	30	—	12·62
		Cholera -	—	—	—	—	—	—	—
		Other Diseases -	28	2	—	2	2	—	1·78
		Total of Febrile Group -	2,809	140	9	149	344	—	153·34
Constitutional Group.									
		Rheumatism -	388	—	—	—	28	15	20·17
		Primary Syphilis -	1,702	—	—	—	10	—	111·93
		Secondary " -	331	—	1	1	45	6	22·93
		Tubercular Diseases -	74	5	8	13	53	57	6·57
		Scurvy and Purpura -	1	—	—	—	1	—	·05
		Other diseases -	23	—	—	—	7	2	1·75
		Total of Constitutional Group -	2,514	5	9	14	144	80	163·50
II.—Local Diseases.									
Diseases of the—									
1		Nervous System -	540	24	1	25	138	47	24·07
2		Eye -	699	—	—	—	21	17	22·62
2		Ear -	188	—	—	—	24	26	10·66
4		Nose -	4	—	—	—	—	—	·14
5		Circulatory System -	166	2	1	3	58	92	11·07
6		Absorbent -	157	—	—	—	10	3	12·74
7		Ductless Glands -	—	—	1	1	—	1	·02
8		Respiratory System -	396	14	1	15	43	16	26·66
9		Digestive -	2,871	82	9	41	260	20	135·14
10		Urinary { Gonorrhœa -	1,011	—	—	—	—	—	58·62
		System { Sequelæ of Gonorrhœa -	76	—	—	—	1	—	5·19
		Other diseases -	96	—	1	1	5	3	5·25
11		Generative System -	91	—	—	—	5	3	4·83
12		Organs of Locomotion -	65	1	—	1	11	14	4·01
13		Cellular Tissue -	326	—	—	—	10	6	15·15
14		Cutaneous System -	797	—	—	—	11	7	38·19
		III.—Debility.	828	1	4	5	350	66	36·73
		IV.—Poisons.	40	4	—	4	—	—	1·48
		V.—Injuries.							
1		General -	2	5	—	5	—	—	·01
2		Local -	900	10	3	13	27	23	39·55
3		In action -	8	1	—	1	—	49	·38
		No appreciable disease -	17	—	—	—	—	—	·36
		Cause unkn. (refers to death only)	—	—	—	—	—	—	—
		General total -	14,601	239	39	278	1,462	473	769·71

\* The average ratios for 10 years

into HOSPITAL. DEATHS, NUMBER INVALIDED and CONSTANTLY SICK among the Ratios per 1,000 of the Strength and the average Ratios for 10 Years.\*

Ratio per 1,000.					Ratio per 1,000 for 1883-84.				
Admissions.	Deaths.	Invalids Sent Home.	Invalids finally discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids Sent Home.	Invalids finally discharged.	Constantly Sick.
5.4	.49	—	—	.50	2.3	.28	—	—	.23
.7	.10	—	—	.04	1.8	—	—	—	.05
51.8	14.18	18.14	—	4.97	29.2	5.71	10.93	—	5.10
202.5	.21	14.89	—	8.98	142.7	.07	3.20	—	6.69
—	—	—	—	—	—	—	—	—	—
29.5	.42	3.13	—	1.32	18.7	—	.29	—	1.01
—	—	—	—	—	12.7	9.67	—	—	.26
2.9	.21	.21	—	.18	1.8	—	.07	—	.14
292.8	15.53	35.86	—	15.99	209.2	15.73	14.48	—	13.48
39.9	—	2.92	1.56	2.10	31.0	—	2.02	.35	2.20
177.4	—	1.04	—	11.67	207.8	—	.63	—	15.96
34.5	.10	4.69	.63	2.39	27.6	—	1.53	.14	2.32
7.7	1.36	5.53	5.94	.70	7.9	1.04	2.85	1.95	1.23
.1	—	.10	—	—	.3	—	—	—	.01
2.4	—	.73	.21	.18	1.2	—	.35	.14	.11
262.0	1.46	15.01	8.34	17.04	275.8	1.04	7.38	2.58	21.83
56.3	2.61	14.39	4.90	2.51	19.4	1.32	5.57	1.67	1.73
72.9	—	2.19	1.77	2.36	43.0	—	1.39	1.18	2.04
19.6	—	2.50	2.71	1.11	11.6	—	.97	.97	.59
.4	—	—	—	.01	.7	—	—	.07	.04
17.2	.31	6.05	9.59	1.15	18.6	.35	5.95	4.73	1.89
16.4	—	1.04	.31	1.33	18.5	—	1.18	.07	1.86
—	.10	—	.10	—	.1	—	—	—	—
41.3	1.56	4.48	1.67	2.78	45.0	1.04	1.04	1.04	2.95
299.8	4.27	27.10	2.08	14.09	205.2	2.09	8.14	.91	9.24
105.4	—	—	—	6.11	85.5	—	—	—	5.00
7.9	—	.10	—	.54	9.7	—	.07	—	.58
10.0	.10	.52	.31	.55	11.4	.28	.49	.21	.57
9.5	—	.52	.31	.50	10.0	—	.42	.28	.70
6.8	.10	1.15	1.46	.42	7.0	—	1.25	.68	.50
34.0	—	1.04	.63	1.58	24.6	—	.70	.14	1.14
83.1	—	1.15	.73	3.98	65.4	—	.63	.35	3.29
86.3	.52	36.49	6.88	3.88	50.6	.07	13.16	1.53	3.84
4.2	.42	—	—	.15	2.5	.21	—	—	.07
.2	.52	—	—	—	.1	.63	—	—	—
93.8	1.36	2.81	2.40	4.12	79.6	1.25	1.32	1.25	3.67
.8	.10	—	5.11	.04	.1	.35	4.80	6.13	1.36
1.8	—	—	—	.04	2.7	—	—	—	.05
—	—	—	—	—	—	—	—	—	—
1,522.0	28.98	152.40	49.80	80.23	1,196.3	24.36	68.84	23.74	76.42

will be given in future years.

ABSTRACT No. XXXIX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS and returning from FOREIGN SERVICE, and proceeding from one Colony or Station

Orders.	Strength of W.O. N.C.O. and Men :		Passage Out.		Passage Home.		Intercolonial.	
	Embarked	-	31,086		18,886		16,560	
	Average Annual Strength	-	1,745		1,067		594	
	Diseases.		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I.—General Diseases.								
Febrile Group.								
Eruptive Fevers	{ Small Pox	-	—	—	1	—	—	—
	{ Other	-	—	—	—	—	—	—
Continued „	{ Enteric	-	9	1	31	3	12	2
	{ Other	-	38	—	85	1	43	—
Yellow Fever	-	-	—	—	—	—	—	—
Paroxysmal Fevers	-	-	11	—	77	—	38	—
Cholera	-	-	—	—	—	—	2	2
Other diseases	-	-	5	—	—	—	—	—
Total	-	-	63	1	194	4	95	4
Constitutional Group.								
Rheumatism	-	-	34	1	16	—	21	—
Primary Syphilis	-	-	496	—	154	—	112	—
Secondary „	-	-	54	—	21	—	30	—
Tubercular diseases	-	-	5	—	6	—	1	—
Scurvy and Purpura	-	-	—	—	—	—	—	—
Other Diseases	-	-	—	—	2	—	—	—
Total	-	-	589	1	199	—	164	—
II.—Local Diseases.								
Diseases of the—								
1 Nervous System	-	-	14	2	7	1	4	1
2 Eye	-	-	14	—	12	—	9	—
3 Ear	-	-	5	—	4	—	1	—
4 Nose	-	-	—	—	—	—	—	—
5 Circulatory System	-	-	3	—	5	—	5	2
6 Absorbent „	-	-	23	—	20	—	6	—
7 Ductless Glands	-	-	—	—	—	—	—	—
8 Respiratory System	-	-	85	2	38	—	21	—
9 Digestive „	-	-	129	—	154	3	57	—
10 Urinary { Gonorrhœa	-	-	355	—	125	—	92	—
System {	Sequelæ of Gonorrhœa	-	32	—	8	—	6	—
	Other diseases	-	30	—	3	—	10	—
11 Generative System	-	-	11	—	5	—	5	—
12 Organs of Locomotion	-	-	6	—	4	—	—	—
13 Cellular Tissue	-	-	37	—	21	—	23	—
14 Cutaneous System	-	-	239	—	49	—	31	—
III.—Debility								
IV.—Poisons								
V.—Injuries.								
1 General	-	-	6	1	3	—	1	1
2 Local	-	-	122	—	35	1	42	—
3 In action	-	-	—	—	—	—	—	—
No appreciable disease	-	-	4	—	1	—	—	—
Cause unknown (refers to deaths only).	-	-	—	—	—	—	—	—
General Total	-	-	1,809	7	924	10	583	10

into HOSPITAL, and DEATHS among the TROOPS on BOARD SHIP, proceeding on abroad to another, with the ratio per 1,000 of the Strength, during the Year 1885.

Ratio per 1,000 of the Strength.					
Passage out.		Passage Home.		Intercolonial.	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	—	·9	—	—	—
—	—	—	—	—	—
5·1	·57	29·0	2·81	20·2	3·37
21·8	—	79·7	·94	72·4	—
—	—	—	—	—	—
6·3	—	72·2	—	64·0	—
—	—	—	—	3·3	3·37
2·9	—	—	—	—	—
36·1	·57	181·8	3·75	159·9	6·74
19·5	·57	15·0	—	85·3	—
284·2	—	144·3	—	188·6	—
30·9	—	19·7	—	50·5	—
2·9	—	5·6	—	1·7	—
—	—	—	—	—	—
—	—	1·9	—	—	—
337·5	·57	186·5	—	276·1	—
8·0	1·15	6·6	·94	6·7	1·68
8·0	—	11·3	—	15·2	—
2·9	—	3·7	—	1·7	—
—	—	—	—	—	—
1·7	—	4·7	—	8·4	—
13·2	—	18·7	—	10·1	3·37
—	—	—	—	—	—
48·7	1·15	35·6	—	35·4	—
73·9	—	144·3	2·81	96·0	—
203·5	—	117·2	—	154·9	—
18·3	—	7·5	—	10·1	—
17·2	—	2·8	—	16·8	—
6·3	—	4·7	—	8·4	—
3·4	—	3·7	—	—	—
21·2	—	19·7	—	38·7	—
137·0	—	45·9	—	52·2	—
22·9	—	30·0	—	11·8	—
1·2	—	4·7	·94	6·7	3·37
3·4	·57	2·8	—	1·7	1·68
69·9	—	32·8	·94	70·7	—
—	—	—	—	—	—
2·3	—	·9	—	—	—
—	—	—	—	—	—
1,036·6	4·01	865·9	9·37	981·5	16·84



ABSTRACT No. XL.—ON THE INFLUENCE OF AGE ON THE MORTALITY.—Table showing the Death Rates of the Warrant Officers, Non-commissioned Officers and Men at the several Ages, arranged by quinquennial Periods, in the several Foreign Commands.

Commands.	Under 20 Years.			20 and under 25.			25 and under 30.			30 and under 35.			35 and under 40.			40 and upwards.		
	Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.	
		1885.	1875-84.		1885.	1875-84.		1885.	1875-84.		1885.	1875-84.		1885.	1875-84.		1885.	1875-84.
Gibraltar	883	6.11	4.05	2,113	4.73	4.70	975	9.23	4.75	309	4.12	6.08	137	2.14	8.38	24	—	18.87
Malta	724	6.91	5.82	2,420	11.16	9.51	1,045	18.17	7.53	407	7.17	8.62	163	4.24	12.41	41	2.48	78.10
Cyprus	46	—	5.40*	209	11.52	7.59*	122	1.8.20	13.54*	34	3.88	23.10.30*	27	2.74	07.14.40*	5	—	—
Egypt	480	4.17	8.35†	3,570	110.32	64.23	54†	40.23	47.15	505	9.17	82.18	224	3.13	39.20	17†	2.37	04.44
Canada	159	—	1.08	569	3.57	3.46	295	4.13	5.6	136	1.7.35	9.09	85	2.23	53.13	36	—	15.38
Bermuda	23	—	2.80†	922	6.51	5.06‡	277	4.14	4.4	92	4.43	4.8	38	3.78	95.5	27†	1.83	33.29
West Indies	79	—	15.42§	604	1.65	20.10§	182	4.21	88.13	70	1.14	29.23	38	1.26	32.15	18§	—	24.10§
Cape of Good Hope and St. Helena.	421	2.47	6.18	1,936	8.26	7.87	1,392	12.8.62	8.91	402	1.2.49	11.72	215	—	11.79	39	3.76	92. —
Mauritius	14	—	—	185	4.21	62.18	56	1.8.77	18.03	43	—	14.67	22	—	10.42	3	1.333	33.57
Ceylon	47	—	3.31	502	4.7.97	10.96	265	2.7.55	10.71	62	1.10	13.13	25	—	23.22	7	—	49.18
China and Straits Settlements.	71	—	5.94	1,239	12.9.68	5.30	980	9.9.18	8.84	217	3.13	82.9	73	—	18.30	19	—	21.87
India	2,207	7.70	7.66	23,008	388.17	08.15	50.18	705.12	72.14	6,669	99.14	84.10	2,768	64.25	13.20	843	23.27	28.41

\* For six years only. (1879 to 1884).

† For two years only. (1883 and 1884).

‡ For five years only. (1875 and 1876, 1882 to 1884).

§ For nine years only. (1875 and 1876, 1878 to 1884).

|| For nine years only. (1875, 1877 to 1884).

ABSTRACT No. XLI.—TABLE taken from the REPORTS of the PRINCIPAL MEDICAL OFFICERS, showing the various CORPS which served in the different HOME DISTRICTS during the year 1885, and some of the most important of their HEALTH STATISTICS.

Brigade or Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Con-stantly Sick.	Ratio per 1,000 of Mean Strength.			Average Duration of each Case of Sick-ness.	
								Ad-mitted.	Died.	In-validated.		
												Average Sick Time to each Soldier.
NORTHERN.												
4th	Dragoon Guards	4	238	249	—	3	13.76	985.1	—	11.63	53.33	days. 19.47
5th	Dragoon Guards	31	234	224	3	10	13.53	937.3	13.82	42.74	57.77	21.09
3rd	Hussars	6	415	386	1	9	20.11	785.5	2.41	21.69	48.46	17.69
4th	Hussars	7	57	51	—	2	2.03	894.7	—	35.09	35.60	13.52
15th	Hussars	4	86	104	1	3	4.14	1209.3	1.16	34.88	48.14	17.57
H/2	Royal Artillery	11	133	183	1	3	7.72	1376.0	7.52	23.56	58.05	21.19
N/2	Royal Artillery	11	71	38	—	1	1.55	535.2	—	14.08	21.83	7.97
O/2	Royal Artillery	11	153	122	—	4	6.24	797.4	—	26.14	40.78	14.88
A/3	Royal Artillery	5	53	51	—	—	2.06	762.3	—	—	38.87	14.09
B/3	Royal Artillery	4	57	51	—	3	2.07	894.7	—	62.63	36.32	13.35
C/3	Royal Artillery	8	75	62	—	2	3.64	826.6	—	26.66	46.53	17.71
G/3	Royal Artillery	13	78	39	—	1	2.13	500.0	—	12.82	27.51	9.97
P/4	Royal Artillery	7	140	142	—	—	6.69	1014.3	—	—	47.78	17.44
Dep't	Royal Artillery, Northern Division	Since formation.	546	429	2	9	20.06	755.7	3.66	16.48	36.74	13.41
	Royal Artillery, Lancashire Division	"	151	115	2	1	5.73	761.6	13.24	6.63	37.95	13.85

Battalion or Detachment.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalidated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Duration of each Case of Sickness, days.
								Admitted.	Died.	Invalidated.	Average Constantly Sick.	
NORTHERN—cont.												
Depôt	Royal Artillery . . .	Since formation.	161	139	1	—	5.93	863.4	6.21	—	32.67	11.92
1st Div.	Royal Artillery, Coast Brigade . . .	"	23	9	1	2	1.04	391.3	45.48	86.96	46.22	13.90
2nd Div.	Royal Artillery, Coast Brigade . . .	"	46	2	—	—	.05	43.5	—	—	1.09	9.12
	Royal Engineers . . .	Various	21	8	3	2	.49	380.9	142.90	95.24	23.33	22.36
1st	East Yorkshire Regiment . . .	14	253	147	—	4	7.52	631.0	—	15.81	29.72	18.67
1st	Gloucestershire Regiment . . .	6	536	678	2	12	31.55	1264.9	3.73	22.39	58.86	21.48
1st	Duke of Cornwall's Light Infantry . . .	—	1	1	—	—	.01	1000.0	—	—	—	3.65
2nd	South Staffordshire Regiment . . .	5	613	741	—	10	48.66	1200.9	—	16.31	79.38	23.97
1st	Northamptonshire Regiment . . .	5	606	692	7	12	26.00	1141.9	11.55	19.80	42.90	15.66
2nd	South Yorkshire Regiment . . .	—	—	5	—	—	1.10	—	—	—	—	80.30
1st	North Staffordshire Regiment . . .	—	—	1	—	—	.06	—	—	—	—	29.20
1st	York and Lancaster Regiment . . .	2	623	1545	3	11	25.99	871.6	4.81	17.06	41.72	15.23
2nd	Rifle Brigade . . .	—	1	1	—	—	.03	1000.0	—	—	—	—
Depôt	Royal Lancaster Regiment . . .	Since formation.	140	143	2	1	3.93	1014.3	14.23	7.14	28.07	10.10
"	Northumberland Fusiliers . . .	"	150	102	1	2	4.59	690.0	6.66	13.33	30.60	11.17
"	Royal Warwickshire Regiment . . .	"	150	124	2	6	5.05	893.6	13.33	40.00	33.53	12.24
"	Liverpool Regiment . . .	"	114	56	5	2	3.60	491.2	45.86	17.55	22.81	8.32
												16.96

Brigade or Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	Invalided.	Average Constantly Sick.		
NORTHERN—cont.													
Depot	West Yorkshire Regiment	-	224	201	1	5	10.43	887.3	4.46	22.32	46.56	days.	18.93
"	East Yorkshire Regiment	-	327	341	1	9	16.73	1042.8	3.06	27.62	51.16	days.	17.91
"	Leicestershire Regiment	-	160	73	1	2	3.13	456.3	6.25	12.50	19.56	days.	15.65
"	Yorkshire Regiment	-	184	51	—	3	3.76	277.2	—	16.30	20.43	days.	20.91
"	Lancashire Fusiliers	-	152	150	1	1	5.03	986.8	6.58	6.58	33.09	days.	12.24
"	Cheeshire Regiment	-	407	270	1	4	16.15	663.4	2.46	9.83	39.68	days.	21.83
"	Royal Welsh Fusiliers	-	181	154	1	—	8.43	850.9	5.62	—	46.57	days.	19.98
"	King's Own Borderers	-	174	135	1	2	4.32	776.0	5.76	11.50	24.53	days.	11.63
"	East Lancashire Regiment	-	159	110	2	—	3.66	691.8	12.53	—	23.02	days.	21.23
"	West Riding Regiment	-	156	155	2	1	6.22	983.6	12.82	6.41	39.87	days.	14.65
"	Border Regiment	-	162	142	1	2	4.96	876.5	6.17	12.35	30.74	days.	12.80
"	South Staffordshire Regiment	-	153	78	—	3	3.86	509.8	—	19.61	25.23	days.	18.06
"	South Lancashire Regiment	-	329	125	2	6	6.71	380.0	6.08	18.24	20.39	days.	19.59
"	Derbyshire Regiment	-	143	104	1	1	6.68	727.3	7.00	7.00	46.71	days.	23.44
"	North Lancashire Regiment	-	114	60	—	—	2.27	626.3	—	—	19.91	days.	13.81
"	Northamptonshire Regiment	-	137	191	2	8	6.17	1394.1	14.00	58.40	45.04	days.	11.79
"	South Yorkshire Regiment	-	436	403	4	3	16.28	924.3	6.88	6.88	37.32	days.	14.74

Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.	
								Ad-mitted.	Died.	In-validated.	Average Con-stantly Sick.			
NORTHERN—cont.														
Depôt	Shropshire Regiment	-	242	148	1	3	3'96	611'5	4'13	12'40	16'36	5'97	9'77	
"	Manchester Regiment	-	149	200	—	4	7'72	1342'3	—	26'84	51'81	18'91	14'09	
"	North Staffordshire Regiment	-	474	269	4	3	11'27	567'5	8'44	6'33	23'78	8'63	15'29	
"	York and Lancaster Regiment	-	123	60	2	3	2'35	467'8	16'26	24'40	19'11	6'97	14'29	
"	Durham Light Infantry	-	612	426	3	25	15'51	686'1	4'90	40'85	25'34	9'25	13'29	
"	Garrison Staff and Departments	-	202	29	3	2	2'27	143'5	14'85	9'90	11'24	4'10	28'57	
"	Other Corps	-	—	4	—	—	10	—	—	—	—	—	—	
EASTERN.														
Depôt	3rd Dragoon Guards	-	15	16	—	1	99	1066'6	—	66'06	66'00	24'09	22'68	
"	6th Dragoons	-	109	119	—	7	7'99	1091'7	—	64'22	73'30	28'75	24'50	
"	4th Hussars	-	261	314	3	11	16'49	1203'1	11'49	42'14	63'18	23'06	19'16	
"	13th Hussars	-	173	412	1	6	19'98	2381'5	5'78	34'08	115'32	42'57	17'67	
"	14th Hussars	-	17	21	—	—	49	1235'3	—	—	28'62	10'52	8'51	
"	16th Hussars	-	145	200	—	9	13'27	1379'3	—	63'07	91'52	33'40	24'21	
"	20th Hussars	-	83	125	—	5	8'81	1506'0	—	60'03	106'14	36'74	25'72	

Battalion.	Corps and Districts.	Completed Years in Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In- valided.	Average Con- stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Time to each Soldier.	Average Duration of each Case of Sick- ness.	
								Ad- mitted.	Died.	In- valided.	Average Con- stantly Sick.			
EASTERN—cont.														
2nd	Royal Artillery	-	426	670	1	21	39.74	1572.8	2.35	49.29	93.28	days.	21.65	
	Eastern Division, Royal Artillery	-	131	95	1	1	4.75	725.2	7.63	7.63	36.26	13.23	18.25	
B/3	Royal Artillery	-	65	55	—	—	3.21	846.7	—	—	49.38	17.83	21.07	
C/3	Royal Artillery	-	0	48	1	2	3.30	800.0	16.66	33.33	55.00	20.07	25.09	
S/2	Royal Artillery	-	121	92	2	5	6.50	760.3	16.53	41.32	53.72	19.60	25.78	
Div.	Sandguard Fort and Norwich	-	132	113	1	4	1.08	98.5	7.57	30.30	8.18	2.96	30.32	
	School of Gunnery, R.A.	-	524	293	3	7	16.92	539.7	5.72	13.35	32.29	11.78	21.08	
1st	Bedfordshire Regiment	-	604	566	4	12	32.16	937.1	0.62	19.86	53.24	19.45	20.73	
1st	Essex Regiment	-	277	219	1	10	11.99	790.6	3.61	33.10	43.23	15.80	19.98	
Depôt	Norfolk Regiment	-	194	207	3	3	6.56	1067.0	15.46	15.46	33.81	12.34	11.56	
"	Lincoln Regiment	-	146	131	—	4	6.15	897.3	—	27.39	42.12	15.37	17.13	
"	Suffolk Regiment	-	163	306	2	7	8.70	1877.3	12.27	42.94	53.37	19.48	10.37	
"	Bedfordshire Regiment	-	124	117	—	—	3.41	943.5	—	—	27.50	10.03	10.64	
"	Essex Regiment	-	129	94	1	2	4.63	728.7	7.75	15.50	33.21	13.94	19.14	
	Garrison Staff and Departments	-	139	54	2	13	8.21	383.5	14.39	93.53	59.06	21.55	55.49	

Brigade or Bat- talion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In- valid.	Average Con- stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Time to Sick each Soldier.	Average Duration of each Case of Sick- ness.	
								Ad- mitted.	Died.	In- valid.	Average Con- stantly Sick.			
WESTERN.														
BEI/B	Royal Horse Artillery	-	218	101	-	2	3.48	463.3	-	9.17	15.96	days.	12.58	
Q/2	Royal Artillery	-	128	157	-	4	7.76	1226.6	-	31.25	60.63	days.	18.04	
A & J 3	Royal Artillery	-	187	111	1	2	5.23	810.2	7.30	14.60	38.17	days.	17.20	
Q/4	Royal Artillery	-	145	174	3	-	8.58	1900.0	20.69	-	59.17	days.	18.00	
1st	Royal Artillery, Cinque Ports Division	-	218	113	-	2	6.79	518.3	-	9.17	31.15	days.	21.93	
1st	Royal Artillery, Northern Division	-	142	108	-	3	6.88	760.6	-	21.13	46.45	days.	23.25	
	Royal Artillery, North Irish Division	-	26	13	-	-	.85	500.0	-	-	32.69	days.	23.67	
	Royal Artillery, Welsh Division	-	116	154	-	2	6.44	1327.6	-	17.24	53.53	days.	15.86	
	Royal Artillery, South Irish Division	-	94	83	2	4	5.53	882.9	21.98	42.55	58.83	days.	24.32	
4 Div.	Royal Artillery, Coast Brigade	-	147	17	3	-	.94	115.6	20.41	-	6.39	days.	20.18	
1st Bde.	Royal Artillery, Western Division	-	187	196	1	8	11.07	1046.1	8.35	42.78	59.20	days.	20.62	
	Royal Artillery, other details	-	129	69	1	1	5.30	534.9	7.75	7.75	41.09	days.	28.04	
1st	Royal Engineers	-	141	67	2	-	3.51	475.2	14.18	-	24.90	days.	19.12	
1st	Royal Warwick Regiment	-	365	297	2	10	19.07	813.7	5.48	27.40	52.25	days.	23.44	
1st	Royal Irish Regiment	-	231	347	2	1	20.76	1502.1	8.68	4.83	89.67	days.	21.84	

Brigade or Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Time to each Sick Soldier.	Average Duration of each case of Sickness.
								Admitted.	Died.	In-validated.	Average Constantly Sick.		
WESTERN—cont.													
1st	Royal North Lancaster Regiment	2	141	183	1	—	8.51	1297.9	7.09	—	60.35	days.	16.97
2nd	King's Royal Rifle Corps	4	713	699	1	12	47.34	980.4	1.40	16.83	66.40		24.72
1st	Gordon Highlanders	4	531	468	1	13	31.84	877.6	1.88	24.48	59.96		24.94
1st	Royal Munster Fusiliers	2	405	278	3	19	16.66	686.4	7.41	46.91	41.13		21.87
	Other Infantry details	Various	28	16	2	—	4.12	615.4	76.92	—	158.46		93.99
Depot	Devonshire Regiment	Since formation.	150	115	4	3	5.97	766.7	26.66	20.00	30.80		18.95
"	Somersetshire Light Infantry	"	135	85	—	1	3.59	548.4	—	6.45	23.16		15.42
"	South Wales Borderers	"	140	128	—	—	3.20	914.3	—	—	22.86		9.13
"	Gloucester Regiment	"	185	204	—	1	7.42	1102.7	—	5.41	40.11		13.27
"	Worcestershire Regiment	"	103	76	—	4	3.55	937.8	—	38.83	34.46		17.05
"	Duke of Cornwall's Light Infantry	"	172	149	—	—	4.15	866.3	—	—	24.13		10.16
"	Welsh Regiment	"	132	77	2	—	3.78	583.3	15.15	—	28.63		17.93
"	Garrison Staff and Departments	Various	133	66	—	1	3.79	496.2	—	7.52	28.50		20.96



Brigade or Bat- talion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In- vali- dated.	Average Con- stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.
								Ad- mitted.	Died.	In- vali- dated.	Average Con- stantly Sick.		
SOUTHERN.													
4th	Dragon Guards	-	26	12	-	-	57	461.5	-	-	21.92	8.00	17.34
5th	Lancers	1	44	55	-	-	9.07	1280.0	-	-	47.05	17.17	13.74
	Royal Horse Artillery	Various	85	56	1	1	4.23	658.8	11.76	11.76	46.76	18.16	27.57
	Royal Artillery	"	1,661	1,521	16	36	76.25	915.7	9.60	21.67	45.92	16.75	18.29
	Royal Engineers	"	92	49	8	-	2.48	533.6	86.95	-	26.96	9.84	18.47
1st	Norfolk Regiment	14	767	712	5	13	38.66	928.3	6.52	16.95	50.40	18.40	19.80
1st	Royal Scots Fusiliers	4	480	315	-	4	10.00	656.2	-	8.33	20.83	7.60	11.59
1st	Cheshire Regiment	15	19	55	-	1	3.15	2884.7	-	52.63	165.79	60.51	20.90
2nd	Worcestershire Regiment	11	88	151	-	1	13.31	1715.9	-	11.86	151.25	55.12	32.17
1st	Royal Sussex Regiment	11	290	306	1	-	14.49	1176.9	3.84	-	55.73	20.34	17.28
2nd	North Lancashire Regiment	2	349	400	2	13	25.21	1146.1	5.73	37.25	72.23	26.65	23.00
1st	Seaforth Highlanders	3	115	85	-	4	5.34	739.1	-	34.78	46.43	16.95	22.63
1st	Royal Irish Rifles	4	15	19	-	-	26	1266.7	-	-	17.33	6.33	4.99
2nd	Royal Irish Fusiliers	2	562	471	3	15	30.92	838.1	8.90	26.69	55.02	20.02	23.88
2nd	Argyll and Sutherland Highlanders	5	626	613	1	8	37.49	979.2	1.60	12.78	59.89	21.86	22.32

Brigade or Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of mean Strength.				Average Duration of each Case of Sickness, days.
								Admitted.	Died.	Invalided.	Average Constantly Sick.	
Depôt	SOUTHERN—cont.											
	Hampshire Regiment	-	318	306	1	8	13.18	989.1	3.14	25.16	41.45	15.74
	Dorsetshire Regiment	-	489	282	—	8	10.69	577.0	—	16.36	21.86	13.83
	Wiltshire Regiment	-	136	129	—	1	4.62	948.5	—	7.35	33.97	13.07
	Rifles	-	503	441	2	6	17.93	876.7	3.97	11.93	35.65	14.84
	Garrison Staff and Departments	-	377	285	4	12	20.83	765.9	10.61	31.83	55.25	20.67
	Other Corps	-	463	239	8	11	14.78	516.2	17.04	23.76	31.92	22.57
D/3 4/1 2/1 8/1 8/1 10 Div. 1st	CHATHAM.											
	Royal Artillery	-	161	145	—	5	10.74	900.6	—	31.05	66.70	27.03
	Royal Artillery, Northern Division	-	113	44	1	—	2.15	389.4	8.84	—	19.06	17.86
	Royal Artillery, Eastern Division	-	108	118	1	—	6.27	1092.6	9.25	—	58.05	19.39
	Royal Artillery, Eastern Division	-	106	88	1	—	5.02	830.2	9.43	—	47.35	20.82
	Royal Artillery, Scottish Division	-	91	60	1	—	3.37	725.2	10.99	—	37.03	18.63
	Royal Artillery, Coast Brigade	-	75	7	1	—	.30	93.3	13.33	—	4.05	15.85
	Royal Engineers	-	1,422	1,106	8	46	68.88	777.7	5.62	32.34	47.03	22.07
	Lancashire Fusiliers	-	120	192	1	2	9.65	1600.0	8.33	16.66	80.41	18.34

Brigade or Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalided.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	Invalided.	Average Constantly Sick.		
OHATHAM—continued.													
Det.	East Surrey Regiment	2	35	50	—	4	3.50	1685.7	—	114.28	102.57	37.43	22.20
1st	Dorsetshire Regiment	3	119	146	1	13	9.34	1226.9	8.40	109.24	78.48	23.64	23.35
2nd	Royal Berkshire Regiment	4	342	480	3	18	28.88	1429.8	8.77	52.63	84.44	30.82	21.55
2nd	Royal West Kent Regiment	3	137	132	—	4	6.22	983.5	—	29.19	45.40	16.57	17.19
	Garrison Staff and Departments	Various	118	79	2	3	5.68	669.1	17.69	26.54	50.24	18.34	23.23
	Other Corps	"	453	110	—	21	6.16	242.8	—	46.35	13.58	4.95	20.42
SOUTH-EASTERN.													
2nd	Dragoon Guards	1½	174	262	—	1	12.67	1505.7	—	5.74	72.81	26.57	17.65
4th	Dragoon Guards	3	173	84	1	1	8.26	485.5	5.78	5.78	47.74	17.42	35.89
5th	Lancers	7½	203	150	1	1	4.67	783.3	4.92	4.92	23.99	8.75	11.18
9th	Lancers	1½	47	82	1	—	3.31	1744.7	21.27	—	70.42	25.70	14.73
10th	Hussars	1	244	252	1	10	15.43	1032.8	4.09	40.98	63.23	23.08	22.35
	Cavalry Depot	14	1,202	1,243	5	57	67.54	1034.1	4.15	47.42	56.18	20.51	19.83
B	Royal Horse Artillery	1	119	94	—	5	8.81	789.9	—	42.01	69.83	25.49	32.26
1st	Royal Artillery	4	260	420	—	14	22.96	1615.4	—	53.84	89.38	32.26	19.97

Battalion or Regiment.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalidated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	Invalidated.	Average Constantly Sick.		
SOUTH-EASTERN—cont.													
1st	Northern Division, Royal Artillery	Various	46	27	—	—	1·61	546·9	—	—	35·00	days.	21·76
1st	Cinque Ports Division, Royal Artillery	"	137	135	—	2	6·41	839·9	—	12·73	40·82	14·90	17·40
1st	Southern Division, Royal Artillery	"	98	77	3	2	4·54	827·9	32·25	21·50	48·81	17·81	21·52
1st	Western Division, Royal Artillery	"	87	50	—	3	2·08	574·7	—	34·46	23·91	8·73	13·18
1st	Scottish Division, Royal Artillery	"	98	100	—	2	5·56	1020·4	—	20·40	56·73	20·71	20·29
1st	Welsh Division, Royal Artillery	"	47	31	—	—	1·33	659·6	—	—	28·30	10·32	15·66
7th	Coast Brigade, Royal Artillery	"	63	17	—	1	1·63	239·8	—	15·87	25·87	9·44	34·99
	Royal Engineers	"	71	51	2	2	2·41	718·3	28·17	28·17	33·94	12·38	17·24
2nd	East Lancashire Regiment	2	402	326	1	12	19·00	810·9	2·48	23·36	47·28	17·25	21·53
2nd	East Surrey Regiment	1½	216	188	1	—	9·91	870·4	4·63	—	45·88	16·74	19·24
1st	Middlesex Regiment	1	572	437	4	13	21·82	764·0	6·99	22·72	37·62	13·73	17·97
1st	Manchester Regiment	1	494	726	2	14	39·08	1500·0	4·13	23·92	80·70	29·45	19·63
1st	York and Lancaster Regiment	1	118	133	1	15	11·69	1127·1	8·47	127·12	99·06	36·16	32·08
1st	Royal Munster Fusiliers	1½	173	137	—	—	6·25	791·9	—	—	36·12	13·18	16·65
Depôt	East Kent Regiment	—	273	384	4	15	24·61	1408·6	14·63	34·94	90·14	32·90	23·39
"	Royal Sussex Regiment	—	387	486	2	16	18·80	1255·8	5·16	41·34	48·58	17·73	14·12

Battalion or Bat-	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.
								Ad-mitted.	Died.	In-validated.	Average Con-stantly Sick.		
SOUTH-EASTERN—cont.													
Depot	Royal West Kent Regiment	-	143	133	—	—	4'54	930'1	—	—	31'74	11'59	12'46
	Commissariat and Transport Corps	-	130	96	—	5	5'00	788'5	—	38'46	46'07	16'82	22'77
	Garrison Staff and Departments	-	75	19	2	2	1'06	253'3	26'06	26'06	26'40	9'63	38'04
	Other Corps	-	210	91	1	1	7'84	433'3	4'76	4'76	37'33	13'62	31'44
HOME.													
1st	Life Guards	-	429	383	2	10	21'46	892'8	44'66	23'31	50'02	18'25	29'45
2nd	Life Guards	-	385	263	1	17	15'87	683'1	2'59	44'15	41'22	15'04	22'03
	Royal Horse Guards	-	419	342	—	11	17'08	816'2	—	26'25	41'06	15'31	18'76
7th	Hussars	-	116	104	2	1	4'23	896'5	7'24	8'62	36'46	13'30	14'84
18th	Hussars	-	349	310	1	16	16'15	898'2	2'86	45'84	46'27	16'89	19'01
C/A	Royal Horse Artillery	-	113	101	—	5	3'51	893'8	—	44'24	31'06	11'33	12'68
	Coast Brigade, Royal Artillery	-	40	12	—	1	7'72	300'0	—	25'00	18'00	6'57	21'90
	Royal Engineers	-	33	7	2	1	3'34	212'1	60'60	30'30	10'39	3'76	17'72
1st	Grenadier Guards	-	315	281	1	1	19'03	892'1	3'17	3'17	63'27	23'09	25'89
2nd	Grenadier Guards	-	952	1,028	9	26	54'56	1,079'8	9'45	27'31	57'31	20'91	19'37
3rd	Grenadier Guards	-	369	462	4	8	29'44	1,324'9	10'84	21'08	79'78	29'12	23'77

Brigade or Bat- talion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In- valided.	Average Con- stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.	
								Ad- mitted.	Died.	In- valided.	Average Con- stantly Sick.			
HOME—cont.														
1st	Coldstream Guards -	-	411	424	3	13	22·83	1031·6	7·29	31·63	53·77	20·36	19·73	days.
2nd	Coldstream Guards -	3	820	1,064	11	45	61·98	1297·5	13·41	62·43	75·58	27·58	21·26	
1st	Scots Guards -	3	537	650	2	20	41·07	1210·4	3·72	37·24	76·49	27·91	23·06	
2nd	Scots Guards -	1½	317	462	5	18	26·66	1425·8	15·77	56·78	80·94	29·54	20·72	
1st	Essex Regiment -	1	347	560	3	4	28·07	1613·8	8·64	11·52	83·77	30·57	18·94	
1st	Seaforth Highlanders -	3	331	317	1	3	12·63	937·7	3·02	9·06	38·24	13·96	14·57	
Depôt	Royal West Surrey Regiment -	Since formation.	118	134	1	5	3·86	1135·5	8·47	42·37	33·47	12·04	10·75	
"	East Surrey Regiment -	"	276	153	3	17	9·34	573·4	10·87	61·59	33·84	12·35	21·57	
"	Oxfordshire Light Infantry -	"	284	307	2	9	13·67	1030·9	7·04	31·69	48·09	17·56	10·25	
"	Royal Berkshire Regiment -	"	119	130	3	8	3·83	1008·4	25·21	67·22	32·19	11·74	11·64	
"	Royal Fusiliers -	"} "	472	369	2	10	13·64	731·7	4·23	21·18	28·89	10·54	13·49	
"	Middlesex Regiment -	"	382	297	2	11	14·45	698·9	5·23	23·79	37·82	13·90	19·75	
"	Garrison Staff and Departments -	Various	14	79	1	18	3·80	5642·8	71·43	1235·71	271·42	99·07	17·55	
"	Other Corps -	"												

Brigade or Battalion.	Corps and Districts.	Completed Years in Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-valued.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	In-valued.	Average constantly Sick.		
WOOLWICH.													
	Cavalry	-	30	24	-	-	1.65	800.0	-	-	55.00	30.07	25.09
Depôt	Royal Horse Artillery	-	454	435	1	13	35.40	1068.3	2.20	39.64	77.97	28.46	26.64
1st	Royal Horse Artillery	-	391	289	3	7	20.98	794.0	9.96	23.35	69.70	25.44	32.04
	Riding Establishment	-	139	117	-	5	8.20	841.7	-	35.97	58.99	21.52	25.68
	Remount Establishment	-	86	50	1	1	4.26	581.4	11.63	11.63	49.53	18.03	31.09
1st	Royal Artillery	-	389	331	1	13	27.68	871.0	2.63	34.21	72.84	26.58	30.52
2nd	Royal Artillery	-	250	252	1	8	19.33	1008.0	4.00	32.00	77.32	23.22	27.99
3rd	Royal Artillery	-	145	108	-	5	9.63	745.8	-	34.48	66.41	24.57	32.54
4th	Royal Artillery	-	11	8	-	-	.22	727.3	-	-	20.00	7.30	10.03
Depôt	Royal Artillery, London Division	-	216	190	-	4	11.69	879.6	-	18.51	54.12	19.75	22.46
3/1	Royal Artillery, Lancashire Division	-	109	134	2	6	10.20	1229.3	18.34	55.04	93.57	34.15	27.78
6/1	Royal Artillery, Lancashire Division	-	-	6	-	-	.12	-	-	-	-	-	7.30
2/1	Royal Artillery, North Irish Division	-	60	56	1	5	5.28	933.3	16.66	33.33	88.00	32.02	34.41
4/1	Royal Artillery, Southern Division	-	53	49	1	1	4.31	942.2	19.23	19.23	82.88	30.25	32.08
	Royal Artillery, Regimental District Staff	Various	357	258	4	15	20.74	301.0	4.66	17.50	24.20	8.83	29.34
	Royal Engineers	-	40	3	-	-	.48	75.0	-	-	12.00	4.38	53.40

Brigade or Battalion.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.			Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	In-validated.		
WOOLWICH—cont.												
1st	Essex Regiment	2	31	26	—	—	1'28	838'7	—	—	41'29	17'96
2nd	Shropshire Light Infantry	4	586	467	5	12	34'46	831'0	8'53	20'47	58'83	25'84
	Commissariat and Transport Corps	Various	441	406	2	10	31'74	1124'7	4'53	23'17	71'97	23'35
	Ordnance Store Corps	"	179	102	2	1	7'68	568'8	11'17	5'58	42'80	27'46
	Medical Staff Corps	"	90	82	1	5	5'47	911'1	11'11	55'55	60'77	24'34
	Other Corps	"	6	4	—	—	'53	668'7	—	—	88'33	46'36
ALDERSHOT.												
Detnt.	Household Cavalry	—	36	—	—	—	—	—	—	—	—	—
2nd	Dragon Guards	14½	332	265	—	5	18'60	798'2	—	15'06	56'02	25'02
1st	Royal Dragoons	32	6	8	1	—	'26	1333'3	166'67	—	43'33	11'86
2nd	Dragoons	33	80	103	—	—	5'81	1167'3	—	—	65'28	20'59
7th	Hussars	4½	346	274	3	6	21'01	748'6	8'20	16'39	57'40	27'96
10th	Hussars	1	239	229	1	3	8'80	958'2	4'18	12'55	36'82	14'03
20th	Hussars	12½	179	176	1	2	12'25	983'2	5'53	11'17	65'11	25'40
	Royal Horse Artillery	Various	368	282	—	13	23'57	766'3	—	35'33	64'05	30'51
1 Bde.	Royal Artillery	"	320	270	2	5	19'31	843'7	6'24	15'62	60'34	26'10



Battalion or Bat-	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Con-stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.
								Ad-mitted.	Died.	In-validated.	Average Con-stantly Sick.		
ALDERSHOT—cont.													
2 Bde.	Royal Artillery	-	140	131	—	3	9.58	935.7	—	21.43	68.43	days.	26.69
3 "	Royal Artillery	-	245	211	2	4	17.82	861.2	8.16	16.33	72.13	26.55	30.83
	Royal Engineers	-	473	513	3	2	25.60	1084.6	6.34	4.21	54.12	19.75	18.21
Det.	Foot Guards	-	180	74	—	3	5.34	389.5	—	15.79	21.11	10.26	26.34
1st	Royal Lancaster Regiment	-	476	461	5	7	29.85	1010.5	10.50	14.71	62.71	22.89	22.65
1st	Leicestershire Regiment	-	643	706	5	8	34.32	1068.4	7.78	12.44	53.37	19.46	17.77
1st	Royal Scots Fusiliers	-	33	45	—	4	4.54	1363.6	—	121.21	137.57	50.23	36.82
2nd	West Riding Regiment	-	211	251	—	—	10.81	1189.6	—	—	51.23	18.70	15.72
2nd	Royal Highlanders	-	452	408	—	8	26.75	902.7	—	17.70	59.18	21.60	23.93
1st	Wiltshire Regiment	-	400	478	2	15	33.34	975.5	4.06	30.61	68.04	24.83	25.46
1st	Seaforth Highlanders	-	164	179	—	—	8.81	1091.5	—	—	53.72	19.61	17.95
2nd	Rifle Brigade	-	544	608	—	20	33.94	1117.6	—	36.76	60.37	22.03	19.71
3rd	Rifle Brigade	-	127	140	1	5	10.05	1102.3	7.87	39.37	70.13	28.98	26.20
Depôt	Royal Fusiliers	-	40	43	—	—	1.80	1075.0	—	—	46.00	16.42	15.28
Depôt	Oxford Light Infantry	-	60	64	—	—	3.88	1066.7	—	—	64.65	23.60	22.13
	Commissariat and Transport Corps	-	719	674	9	11	46.96	937.4	12.52	15.30	65.31	23.83	25.43

Battalion or Bat-	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Con-stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each case of Sick-ness.
								Ad-mitted.	Died.	In-validated.	Average Con-stantly Sick.		
ALDERSHOT—cont.													
Det.	Medical Staff Corps	-	567	792	8	6	35.12	1394.8	14.11	10.58	61.94	22.61	16.18
	Garrison Staff and Departments	-	105	26	-	1	1.49	247.6	-	9.52	14.19	5.18	20.92
	Sandhurst	-	135	-	-	-	-	-	-	-	-	-	-
	Other Corps	-	103	250	-	3	12.92	2427.2	-	29.13	125.43	45.78	18.86
NORTH BRITISH.													
2nd	Dragoons	-	355	289	2	2	13.90	811.8	5.62	5.62	39.04	14.25	17.50
1th	Hussars	-	84	129	1	-	6.83	1535.7	11.90	-	81.31	29.68	19.17
1/4	Royal Artillery	-	138	160	-	2	8.72	1159.4	-	14.49	63.19	23.06	19.87
Depôt	Royal Artillery, Scottish Division	-	140	96	-	5	4.04	685.7	-	35.71	23.86	10.53	15.36
5th Div.	Royal Artillery, Coast Brigade	-	41	5	-	-	.55	121.9	-	-	13.41	4.90	40.15
2nd	Royal Scots Regiment	-	597	625	2	11	37.24	1046.9	3.35	18.43	63.38	22.77	21.75
1st	Scottish Rifles	-	607	730	8	2	31.24	1202.6	13.18	3.29	51.47	18.79	15.62
Depôt	Royal Scots	-	199	105	2	2	5.25	527.6	10.05	10.05	26.38	9.63	18.25
"	Royal Scots Fusiliers	-	125	97	-	-	4.42	776.0	-	-	35.36	12.91	16.63
"	Scottish Rifles	-	133	60	-	5	1.89	451.1	-	37.59	14.21	5.19	11.50

Battalion. or Bat.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In- valided.	Average Con- stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.
								Ad- mitted.	Died.	In- valided.	Average Con- stantly Sick.		
NORTH BRITISH—cont.													
Depôt	Highland Light Infantry	-	192	80	2	4	2'88	418'6	10'42	20'83	15'00	5'47	13'14
"	Royal Highlanders	-	151	100	1	4	2'51	662'2	6'62	26'49	16'62	6'07	9'16
"	Seaforth Highlanders	-	138	43	1	1	2'03	311'6	7'25	7'25	14'71	5'37	17'23
"	Cameron Highlanders	-	447	177	4	6	7'14	395'9	8'95	13'42	15'97	5'83	14'73
"	Gordon Highlanders	-	114	67	-	-	2'37	587'7	-	-	20'79	7'59	12'91
"	Argyll and Sutherland Highlanders	-	121	45	1	-	1'73	371'9	8'26	-	14'30	5'22	14'03
"	Garrison Staff and Departments	-	94	2	6	6	1'82	31'3	63'83	63'83	19'36	7'06	332'15
"	Military prison	-	55	-	-	-	-	-	-	-	-	-	-
CHANNEL ISLES.													
2/1	Royal Artillery, Lancashire Division	11	79	79	-	2	4'97	1000'0	-	25'32	62'91	22'96	22'96
3/1	Royal Artillery, Lancashire Division	9	14	19	-	-	'80	1357'1	-	-	57'14	20'86	15'37
3/1	Royal Artillery, Eastern Division	4	116	43	1	-	1'90	370'7	8'62	-	16'38	5'93	16'13
1/1	Royal Artillery, Cinque Ports Division	8	16	10	-	-	'68	625'0	-	-	42'50	15'51	24'82
2/1	Royal Artillery, Cinque Ports Division	11	38	27	-	-	1'23	710'5	-	-	32'37	11'81	16'63
"	Royal Artillery, Coast Brigade	Various	56	3	-	-	'61	53'6	-	-	10'59	3'98	74'22

Battalion or Bat-	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Con-stantly Sick.	Ratio per 1,000 of Mean Strength.			Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.
								Ad-mitted.	Died.	In-validated.		
CHANNEL ISLES—cont.												
2nd	Worcestershire Regiment	-	544	689	4	8	38.70	1284.9	7.35	14.70	67.46	days. 19.16
1st	Wiltshire Regiment	-	65	80	—	—	3.07	1380.8	—	—	47.23	17.24
2nd	Gordon Highlanders	-	17	20	—	—	.43	1176.5	—	—	25.29	9.23
1st	Royal Irish Rifles	-	571	427	4	3	30.35	747.8	7.00	5.25	35.64	17.39
	Staff and Departments	-	26	2	—	2	.23	76.9	—	76.92	8.46	40.15
	Other Corps	-	6	23	—	—	1.49	4166.7	—	—	246.33	21.75
BELFAST.												
1st	Royal Dragoons	-	333	251	1	5	11.85	742.6	2.96	14.79	35.05	17.23
5th	Lancers	-	59	44	—	2	1.87	745.8	—	33.89	31.69	15.51
16th	Lancers	-	65	51	1	4	2.27	764.6	15.33	61.53	34.92	16.24
Depôt	North Irish Division, Royal Artillery	-	160	107	2	3	5.14	445.7	13.60	18.76	33.12	17.64
8th Div.	Coast Brigade, Royal Artillery	-	29	1	—	—	.02	34.4	—	—	.69	7.30
1st	Devonshire Regiment	-	626	532	6	19	21.21	849.8	36.43	30.35	33.88	14.55
1st	Somersetshire Light Infantry	-	410	254	3	2	13.48	619.5	7.31	4.87	32.87	19.33
2nd	Royal Inniskilling Fusiliers	-	573	558	5	30	24.04	973.8	8.72	52.35	59.40	23.26
2nd	East Lancashire Regiment	-	193	142	1	—	6.29	735.7	5.18	—	32.59	16.17

Battalion, or Brigade or Bat-	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In- vali- dated.	Average Con- stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.
								Ad- mitted.	Died.	In- vali- dated.	Average Con- stantly Sick.		
BELFAST—cont.													
1st	Highland Light Infantry	-	183	170	2	4	8.30	928.9	10.83	21.85	45.35	days.	17.82
Depôt	Royal Inniskilling Fusiliers	-	155	110	—	7	2.74	709.6	—	45.16	17.67	6.45	9.09
"	Royal Irish Rifles	-	195	99	1	2	5.20	507.7	5.12	10.25	28.41	9.73	19.17
"	Royal Irish Fusiliers	-	176	50	1	1	1.77	284.1	5.68	5.68	10.05	3.67	12.92
	Garrison Staff and Departments	-	39	6	1	—	.27	153.8	25.64	—	6.92	2.52	16.42
	Other Corps	-	14	8	1	1	2.02	571.4	71.42	71.42	144.28	52.66	92.16
DUBLIN.													
5th	Dragoon Guards	-	26	10	—	—	.33	354.6	—	—	12.31	4.49	11.63
Det.	Royal Dragoons	-	24	17	—	—	.35	708.3	—	—	14.53	5.32	7.51
1st	Lancers	-	86	55	—	3	6.92	639.5	—	34.88	80.46	29.37	45.92
8th	Lancers	-	338	328	2	9	21.00	845.4	5.15	23.20	54.12	19.76	23.37
16th	Hussars	-	472	468	2	3	36.05	1033.9	4.24	6.36	76.38	27.88	29.96
18th	Royal Horse Artillery	-	187	245	—	9	16.04	1310.2	—	46.13	85.77	31.31	23.88
	Royal Artillery	-	324	257	3	12	18.15	763.2	9.26	37.04	56.02	20.45	25.78
	Royal Engineers	-	43	16	—	—	1.19	372.1	—	—	27.67	10.10	27.15
1st	Grenadier Guards	-	433	497	2	8	38.06	1150.5	4.63	18.52	88.14	32.17	27.97

Battalion or Regt.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.
								Admitted.	Died.	In-validated.	Average Constantly Sick.		
DUBLIN—cont.													
1st	Santa Guards -	1	187	279	3	4	13.14	1,492.0	16.04	21.39	64.92	23.70	15.98
1st	Northumberland Fusiliers -	5	575	583	6	19	38.71	1,013.9	10.45	33.04	67.32	24.57	24.24
1st	Liverpool Regiment -	6	143	138	—	1	6.66	945.0	—	6.99	46.57	17.00	17.62
1st	Somersetshire Light Infantry -	6	147	118	—	—	5.38	892.7	—	—	36.66	13.36	16.64
1st	West Yorkshire Regiment -	5	409	272	4	—	11.64	665.0	9.78	—	28.46	10.39	15.62
2nd	King's Own Borderers -	9	615	673	5	4	49.24	1,094.3	8.13	6.50	80.07	29.22	26.71
1st	Duke of Cornwall's Light Infantry -	8	723	805	4	27	60.15	1,114.5	5.53	37.34	83.20	30.37	27.27
2nd	Border Regiment -	8	611	733	2	1	45.04	1,199.7	3.27	1.64	73.72	26.91	22.43
2nd	Welsh Regiment -	5	560	412	4	—	18.63	735.7	7.14	—	33.27	12.14	16.50
1st	Derbyshire Regiment -	8	399	243	1	—	11.19	609.0	2.51	—	38.05	10.24	16.81
2nd	Royal Berkshire Regiment -	4	116	99	—	—	3.30	853.4	—	—	28.45	10.38	12.17
2nd	Royal West Kent Regiment -	3	17	12	2	—	.69	715.9	117.65	—	40.59	14.82	21.00
Det. 1st	Highland Light Infantry -	5	395	436	1	7	26.24	1,103.8	2.53	17.72	66.43	24.25	21.96
2nd	Leinster Regiment -	8	349	128	1	—	4.92	866.8	2.87	—	14.10	5.15	14.03
Depôt	Connaught Rangers -	Since formation.	183	74	2	—	2.74	404.4	10.95	—	14.97	5.47	13.51
"	Leinster Regiment -	"	184	91	2	—	2.51	494.6	10.87	—	13.64	4.98	10.07
"	Royal Dublin Fusiliers -	"	390	327	4	—	14.48	819.5	10.03	—	36.29	13.25	16.16

Battalion or Bat-	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Con-stantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.	
								Ad-mitted.	Died.	In-validated.	Average Con-stantly Sick.			
DUBLIN—cont.														
	Commissariat and Transport Corps	-	277	293	2	3	17.78	1068.6	7.22	10.83	64.19	23.43	21.92	
	Medical Staff Corps	-	52	27	-	-	2.33	519.2	-	-	44.81	16.35	31.50	
	Staff and Departments	-	52	6	-	1	.97	115.4	-	19.23	18.65	6.81	59.01	
	Other Corps	-	128	91	4	45	15.87	710.9	31.25	351.57	123.98	45.25	63.65	
	Musketry	-	165	86	-	-	5.52	521.2	-	-	33.45	12.21	23.43	
CORK.														
11th	Hussars	-	436	369	3	13	16.47	846.3	6.63	29.82	37.78	13.79	16.29	
21st	Hussars	-	460	352	2	8	14.57	765.2	4.35	17.39	31.67	11.56	15.11	
	Various	-	10	-	-	-	-	-	-	-	-	-	-	
	Royal Artillery	-	1,049	683	8	15	36.24	680.6	7.62	14.29	34.54	13.60	19.07	
	Royal Engineers	-	54	10	1	1	.65	185.1	18.51	18.51	12.03	4.39	23.72	
1st	Royal West Surrey Regiment	-	749	718	2	7	33.84	933.6	2.67	9.34	45.18	15.68	16.36	
1st	East Kent Regiment	-	60	56	-	2	2.49	933.3	-	33.33	41.50	15.15	16.23	
1st	Royal Warwickshire Regiment	-	185	108	-	-	6.79	908.1	-	-	36.70	13.39	14.76	
2nd	Suffolk Regiment	-	939	689	5	13	29.86	627.3	5.31	13.84	31.79	12.24	19.52	
2nd	Yorkshire Regiment	-	656	354	3	4	19.05	539.6	4.57	6.09	29.04	10.60	19.64	
1st	Lancashire Fusiliers	-	299	193	1	3	8.84	635.5	3.34	10.04	29.56	10.79	16.46	

Battalion or Part.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalidated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Time to each Sick Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	Invalidated.	Average Constantly Sick.		
CORK—continued.													
2nd	Royal Welsh Fusiliers	6	505	421	3	3	20.05	833.6	5.94	5.94	39.70	14.49	17.98
1st	South Wales Borderers	6	388	233	3	7	10.58	600.5	5.15	18.04	27.27	9.95	16.57
2nd	West Riding Regiment	9	412	355	2	9	12.92	861.6	4.85	21.34	30.35	11.44	13.28
1st	Derbyshire Regiment	1	133	69	—	1	3.21	518.8	—	7.52	24.13	8.81	16.98
1st	King's Royal Rifle Corps	7	531	298	2	7	16.70	512.9	3.44	12.05	28.74	10.49	20.46
2nd	Connaught Rangers	3	639	548	6	11	26.83	857.6	9.39	17.21	41.99	15.33	17.87
2nd	Leinster Regiment	2	203	105	1	—	5.93	812.8	4.92	—	29.21	10.66	13.12
Depôt	Royal Irish Regiment	Since formation.	298	183	2	6	8.28	614.1	6.71	20.13	27.78	10.14	16.51
"	Royal Munster Fusiliers	"	116	127	1	1	4.22	1094.8	8.62	8.62	36.38	13.28	12.13
	Garrison Staff and Departments	Various	79	41	—	1	1.70	518.9	—	12.65	21.39	7.90	15.04
	Other Corps	"	84	14	2	6	5.11	108.6	23.80	71.42	60.83	22.20	133.22
CUBBAGH.													
5th	Dragoon Guards	29	327	231	4	1	12.65	706.4	12.23	3.06	38.68	14.12	19.99
1st	Royal Dragoons	29	174	161	1	2	7.66	925.3	5.74	11.49	44.02	16.07	17.36
A/A	Royal Horse Artillery	10	54	43	1	2	2.28	796.3	18.51	37.04	42.22	15.41	19.35
M/A	Royal Horse Artillery	7	71	40	—	3	1.97	563.4	—	42.25	27.75	10.13	17.98



Battalion or Battery.	Corps and Districts.	Completed Years of Service in United Kingdom since last return from Foreign Service.	Average Annual Strength.	Admitted into Hospital.	Died.	In-validated.	Average Constantly Sick.	Ratio per 1,000 of Mean Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
								Admitted.	Died.	In-validated.	Average Constantly Sick.		
CURRAGH—continued.													
K/4	Royal Artillery	-	119	97	—	7	6.24	815.1	—	58.82	52.44	19.13	23.48
L/2	Royal Artillery	-	78	56	1	1	2.88	717.9	12.82	12.82	36.92	13.47	18.27
N/1	Royal Artillery	-	30	29	—	—	1.28	966.7	—	—	42.07	15.57	16.11
R/4	Royal Artillery	-	51	56	—	1	2.80	1068.0	—	19.61	54.90	20.04	18.25
Det.	Royal Engineers	-	39	16	—	—	.52	410.3	—	—	13.33	4.87	11.86
1st	Liverpool Regiment	-	556	479	4	10	27.94	861.5	7.19	17.99	50.25	18.34	21.29
1st	Lincolnshire Regiment	-	451	423	1	3	21.64	938.3	2.20	6.61	47.67	17.40	18.54
2nd	Yorkshire Regiment	-	46	33	—	1	2.50	717.4	—	21.74	54.35	19.84	27.65
1st	South Wales Borderers	-	146	170	1	2	9.22	1164.4	6.85	13.69	56.30	20.55	17.64
2nd	Royal Inniskilling Fusiliers	-	151	208	2	—	9.15	1377.5	13.24	—	60.60	22.12	16.06
2nd	Royal Highlanders	-	20	28	—	—	.79	1400.0	—	—	39.50	14.42	10.30
2nd	Royal West Kent Regiment	-	418	251	3	7	15.29	600.5	7.18	16.74	36.68	13.35	22.23
Det.	Royal Dublin Fusiliers	-	83	86	—	—	5.05	924.7	—	—	54.30	19.82	21.43
"	Commissariat and Transport Corps	-	179	130	1	2	7.00	726.2	5.68	11.17	39.11	14.27	19.65
"	Staff and Departments	-	79	102	—	8	26.00	1291.1	—	101.27	329.11	120.13	98.04
"	Other Corps	-	329	291	2	—	19.13	884.5	6.06	—	58.15	21.22	23.99

ABSTRACT No. XLII.—Table, taken from the Reports of the Principal Medical Officers, showing the various Corps which served in the different Foreign Commands during the year 1885, and some of the most important of their Health Statistics.

Battalion or Detachment.	Corps and Commands.	Completed Years of Service in Foreign Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.
					In the Com-mand.	Of Invalids.	Total.			Ad-mitted.	Died.	In-vali-dated.	Con-stantly Sick.		
GIBRALTAR.															
	Royal Artillery	-	814	614	8	1	9	30	38'08	764.2	11'06	36'85	46'75	17'06	22'62
	Royal Engineers	-	268	200	2	-	2	11	13'19	746.2	7'46	41'05	49'28	17'97	24'07
1st	Royal Fusiliers	-	720	636	5	1	6	22	35'86	833.3	8'33	50'56	49'80	18'18	20'58
1st	Norfolk Regiment	-	15	27	-	-	-	-	'84	1800'0	-	-	56'00	20'44	11'36
1st	East Yorkshire Regiment	-	509	830	1	1	2	24	35'76	1630.6	3'92	47'15	70'25	25'64	15'72
1st	Cheshire Regiment	-	672	787	4	-	4	25	43'23	1171.1	5'75	37'20	64'33	23'48	20'05
2nd	Oxfordshire Light Infantry	-	236	237	1	-	1	8	17'20	1258.4	4'24	33'90	72'88	26'60	21'14
2nd	Durham Light Infantry	-	113	101	2	-	2	6	9'30	883.8	17'70	53'09	82'30	30'03	33'60
2nd	Royal Dublin Fusiliers	-	146	131	-	1	1	7	8'99	897.2	6'86	47'95	61'58	22'48	25'05
3rd	Rifle Brigade	-	747	896	5	-	5	33	46'07	1186.0	6'69	44'17	61'67	22'51	19'98
	Garrison Staff and Departments	-	110	77	1	-	1	4	4'08	700.0	9'09	36'09	37'09	13'54	19'35
	Other Corps	-	3	1	2	-	12	1	1'00	333.3	666'66	333.33	333.33	121.67	303.00
MALTA.															
	Royal Artillery, Cinque Ports Division.	-	-	-	-	-	-	-	'05	-	-	-	-	-	-
	Royal Artillery, London Division	5	316	235	3	1	4	16	13'82	806.9	12'65	50'63	50'06	18.27	22.64

Brigade or Battalion.	Corps and Commands.	Completed Years of Service in Foreign Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Duration of each Case of Sick-ness.
					In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalided.	Constantly Sick.	
MALTA—cont.														
	Royal Artillery, Scottish Division	3½	77	36	2	—	2	2	2·09	467·5	25·97	25·97	27·14	days. 9·90 21·19
	Royal Artillery, North Irish Division.	1½	97	44	—	—	—	1	3·03	433·6	—	10·30	31·23	25·13
	Royal Artillery, South Irish Division	3½	443	263	—	1	1	5	12·11	563·6	2·25	11·23	27·33	9·97 16·80
	Royal Engineers	5½	147	104	6	—	6	3	6·16	707·4	40·81	20·40	41·90	15·29 21·61
1st	East Kent Regiment	1	580	564	12	—	12	14	37·20	973·4	20·68	24·13	64·13	23·41 24·07
1st	Duke of Cornwall's Light Infantry	—	7	17	—	—	—	—	·23	2423·5	—	—	37·14	13·55 5·68
2nd	Royal Sussex Regiment	3½	60	35	1	1	2	1	3·37	700·0	40·00	20·00	67·40	24·60 35·14
1st	Hampshire Regiment	1½	975	719	9	—	9	20	30·45	737·4	9·23	20·51	40·46	14·76 20·32
1st	Dorsetshire Regiment	1	571	837	5	—	5	31	65·37	1465·8	8·75	54·29	114·48	41·78 23·50
2nd	South Yorkshire Regiment	1	841	888	15	1	16	11	51·83	1055·9	19·03	13·08	61·63	22·49 21·30
1st	Gordon Highlanders	1	229	308	2	—	2	4	16·75	1344·9	8·72	17·46	73·10	23·69 19·84
1st	Shropshire Light Infantry	1	150	84	2	1	3	10	10·65	560·0	19·09	66·66	71·00	25·91 46·27
	Commissariat and Transport Corps	Various	8	5	—	—	—	—	·67	625·0	—	—	83·75	30·56 43·91
	Medical Staff Corps	"	52	43	3	—	3	1	1·91	823·9	57·69	19·23	36·73	13·40 16·21
	Ordnance Store Corps	"	6	5	1	—	1	—	·12	833·3	166·66	—	20·00	7·30 8·76
	Garrison Staff and Departments	"	20	4	—	—	—	—	·22	200·0	—	—	11·00	4·01 20·07
	Other Corps	"	33	38	2	—	2	5	4·98	1151·5	60·60	151·51	150·90	55·08 47·83

Brigade or Bat-	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number con- stantly Sick.	Ratio per 1,000 of Strength.				Average Time to Sick Soldier.	Average Duration of each Case of Sick- ness.
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- val- idated.	Con- stantly Sick.		
OTZEUZ.															
6th	Royal Artillery, Southern Division	Various	14	10	—	—	—	1	34	714.3	—	71.43	24.28	days.	13.41
3rd	Grenadier Guards	"	90	90	3	1	4	—	3.10	1000.0	44.44	—	34.44	12.57	13.57
1st	Coldstream Guards	"	99	133	5	—	5	—	6.08	1333.3	50.90	—	61.41	22.41	16.81
2nd	Scots Guards	"	94	115	3	—	3	—	4.16	1233.4	31.91	—	44.25	16.15	13.90
1st	King's Shropshire Light Infantry	"	69	51	1	—	1	—	2.87	739.1	14.49	—	37.24	13.59	18.23
3rd	King's Royal Rifles	1	413	460	2	—	2	4	18.35	1113.8	4.84	9.68	44.43	16.31	14.56
	Garrison Staff and Departments	Various	73	60	3	—	3	2	2.55	821.9	41.09	27.89	34.93	17.77	13.51
CANADA.															
	Royal Artillery	Various	333	216	1	—	1	7	7.08	693.7	3.09	23.29	23.77	8.67	13.97
	Royal Engineers	"	133	46	3	—	3	2	2.65	373.9	24.39	16.26	21.54	7.96	21.02
2nd	Royal Irish Rifles	3	787	643	8	—	6	25	41.03	815.7	7.63	51.76	52.89	19.31	23.67
	Garrison Staff and Departments	Various	40	6	—	—	—	—	23	150.0	—	—	5.75	2.15	13.99
BERMUDA.															
	Royal Artillery	5	205	107	3	—	3	11	7.13	522.0	14.03	53.66	34.88	12.73	24.39
	Royal Engineers	3	135	118	5	—	5	2	6.19	637.8	27.03	10.81	33.46	12.21	19.14

Brigade or Battalion.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to Trench Soldier.	Average Duration of each Case of Sick- ness.
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- valids.	Con- stantly Sick.		
BERMUDA—cont.															
1st	North Staffordshire Regiment	—	9	9	—	—	—	—	35	1000·0	—	—	38·89	14·19	14·19
2nd	York and Lancaster Regiment	2	898	425	6	—	6	18	23·59	473·3	6·68	20·00	26·27	9·59	20·26
	Garrison Staff and Departments	—	88	25	4	—	4	2	1·55	284·1	48·46	22·73	17·61	6·48	23·64
WEST INDIES.															
	Royal Artillery, Coast Brigade	Various	2	—	—	—	—	—	—	—	—	—	—	—	—
6/1	Royal Artillery (Cinque Ports Di- vision).	3	101	59	1	—	1	2	2·55	584·1	9·08	19·80	2·52	9·21	15·77
6/1	Royal Artillery, London Division	—	7	10	—	—	—	—	·40	1423·5	—	—	5·71	20·85	14·60
3/1	Royal Artillery, Welsh Division	—	5	17	1	—	1	—	·37	3400·0	200·00	—	74·00	27·01	7·94
6/1	Royal Artillery, Welsh Division	1	108	112	2	—	2	3	4·99	1036·7	18·51	27·27	46·20	16·86	16·96
	Royal Engineers	Various	11	4	—	—	—	—	·20	363·6	—	—	18·18	6·68	18·25
1st	North Staffordshire Regiment	1	611	602	2	—	2	9	20·32	985·2	3·27	14·73	49·62	13·60	11·13
	Detachment of Infantry	Various	22	18	1	—	1	2	·43	818·1	48·46	90·90	21·81	7·96	9·73
	Garrison Staff and Departments	"	33	8	—	—	—	1	·46	242·4	—	30·30	13·93	5·08	20·98
CAPE OF GOOD HOPE AND ST. HELENA.															
6th	Dragoons	5	244	199	1	—	1	13	11·12	815·6	4·10	53·28	45·57	16·63	20·40
13th	Hussars	1	248	253	2	—	2	13	11·91	1045·4	8·26	53·71	49·21	17·96	17·18

Battalion or Regt.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Duration of each Case of Sick- ness.
					In Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- valids.	Con- stantly Sick.	
	CAPE OF GOOD HOPE AND ST. HELENA—cont.													days.
C/1	Royal Artillery	5	61	34	1	—	1	5	3.19	537.4	16.39	81.97	53.30	34.25
1/1	Royal Artillery, South Irish Divi- sion.	1	51	92	1	—	1	4	3.94	1803.9	19.61	78.43	77.25	15.63
7/1	Royal Artillery, Western Division	6	110	37	—	—	—	—	2.26	336.4	—	—	20.54	22.29
8/1	Royal Artillery, Western Division	6	93	64	—	—	—	4	5.44	688.1	—	43.01	53.49	31.02
9/1	Royal Artillery, Western Division	—	6	5	—	—	—	1	.33	833.3	—	166.66	53.00	24.09
H/4	Royal Artillery	—	178	135	2	—	2	8	8.81	758.4	11.24	44.94	49.49	23.82
	Royal Engineers	Various	99	58	1	—	1	1	3.05	585.9	10.10	10.10	30.81	19.19
1st	Royal Scots Regiment	1	231	340	1	—	1	12	15.83	1471.9	4.53	51.95	68.53	16.90
2nd	South Lancashire Regiment	1	703	494	8	—	8	10	21.72	703.7	11.38	14.22	30.90	16.05
1st	Welsh Regiment	5	546	474	3	—	3	16	28.17	868.1	5.49	29.30	51.59	21.69
2nd	Northamptonshire Regiment	6	533	624	6	1	7	53	39.58	1172.9	13.16	99.63	74.40	23.15
1st	Argyll and Sutherland Highlanders	6	597	492	6	—	6	15	31.71	824.1	10.05	25.13	53.12	23.52
1st	Royal Inniskilling Fusiliers	—	57	60	—	—	—	—	1.97	1082.6	—	—	34.56	11.98
	Garrison Staff and Departments	Various	189	111	2	—	2	3	16.38	587.3	10.53	15.87	86.67	53.84

Brigade or Battalion.	Corps and Commands.	Completed Years of Service in Foreign Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick-ness.
					In the Command.	Of Invalids.	Totals.			Admitted.	Invalidated.	Constantly Sick.			
MAURITIUS.															
9/1	Royal Artillery, Western Division	2	84	136	—	—	—	5	6.08	1619.0	—	59.53	72.38	28.42	16.32
	Royal Engineers	—	9	6	1	—	1	—	.11	666.7	111.11	—	12.22	4.46	6.69
1st	Welsh Regiment	1	198	651	4	—	4	9	19.04	3337.9	20.20	45.45	100.71	36.76	11.18
1st	Royal Inniskilling Fusiliers	—	53	99	1	—	1	—	3.33	1867.9	18.87	—	63.64	23.86	12.24
	Garrison Staff and Departments	—	14	6	—	—	—	—	.06	423.6	—	—	4.23	1.56	3.65
CEYLON.															
5/1	Royal Artillery, Eastern Division	9	96	102	1	—	1	2	6.03	1073.7	10.53	21.05	63.47	23.17	21.58
6/1	Royal Artillery, Eastern Division	9	100	125	3	—	3	7	6.86	1250.0	30.00	70.00	68.50	25.00	20.00
1st	Argyll and Sutherland Highlanders	—	56	94	—	—	—	—	3.64	1678.6	—	—	65.00	23.72	14.13
1st	Royal Dublin Fusiliers	7	535	627	2	1	3	15	34.42	1172.0	5.61	23.04	64.34	23.48	20.04
	Garrison Staff and Departments	Various	23	2	1	—	1	—	.19	86.9	43.46	—	8.26	3.02	34.67

Brigade or Battalion.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Duration of each Case of Sick- ness.
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- vali- dated.	Con- stantly Sick.	
CHINA AND STRAITS SETTLEMENTS.														
1/1	Royal Artillery, Leicestershire Division.	3	106	122	2	—	2	3	4.52	1150.9	18.87	29.30	42.64	days. 15.56
2/1	Royal Artillery, Southern Division.	—	56	60	1	—	1	—	2.55	1071.4	17.86	—	45.53	15.51
8/1	Royal Artillery, Southern Division.	9	117	77	2	—	2	9	3.99	658.1	17.09	76.92	34.10	12.45
9/1	Royal Artillery, Southern Division.	2	117	66	1	—	1	4	3.02	564.1	8.55	34.19	25.81	9.42
	Royal Engineers	Per- manent.	50	31	—	1	1	2	1.12	620.0	20.00	40.00	22.40	8.18
1st	East Kent Regiment	—	201	270	2	—	2	1	10.97	1348.3	9.85	4.18	54.58	10.93
2nd	East Kent Regiment	6	710	628	12	—	12	30	24.84	881.7	16.90	42.25	34.98	12.77
1st	Royal Inniskilling Fusiliers	6	671	1052	3	—	3	39	35.32	1567.8	4.47	58.12	52.64	12.25
2nd	Northamptonshire Regiment	—	111	132	—	—	—	—	7.28	1189.2	—	—	63.58	23.94
	Garrison Staff and Departments	Various	49	17	1	1	1	1	.36	346.9	20.41	20.41	7.35	2.68



Brigade or Bat.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sick- ness.
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- valids.	Con- stantly Sick.		
	Egypt.													days.	days.
	Camel Corps	-	18	19	1	1	2	6	1.38	1055.5	111.11	333.33	76.66	27.98	26.51
5th	Dragoon Guards	-	-	1	-	-	-	1	.05	-	-	-	-	-	16.35
6th	Royal Irish Lancers	-	3	7	-	2	2	1	1.30	2333.3	666.66	333.33	433.33	158.16	67.78
11th	Hussars	-	-	3	-	-	-	-	.11	-	-	-	-	-	13.38
14th	Hussars	-	-	-	-	-	-	-	.03	-	-	-	-	-	-
16th	Hussars	-	292	497	8	-	8	50	25.40	1702.0	27.39	171.23	86.96	31.75	18.65
19th	Hussars	3	-	-	-	-	-	-	.08	-	-	-	-	-	-
20th	Hussars	-	111	216	5	1	10	-	11.10	1946.0	-	-	100.00	36.50	18.75
20th	Hussars	-	60	181	4	-	-	31	10.90	5016.6	58.48	51.66	181.66	66.30	21.98
G/B	Royal Horse Artillery	3	118	197	3	-	3	22	9.92	1689.5	25.48	186.44	84.06	30.68	18.38
I/1	Royal Artillery	-	26	18	2	-	2	4	2.90	692.3	76.62	183.84	111.53	40.40	58.80
I/2	Royal Artillery	3	99	145	2	-	2	19	11.79	1444.4	20.20	191.91	119.06	43.46	30.06
6/1	Royal Artillery, Southern Division	-	65	127	4	-	4	27	4.44	1963.8	61.63	415.38	68.30	24.98	12.76
5/1	Royal Artillery, Scottish Division	3	107	262	3	1	4	18	16.90	2448.6	37.37	168.22	167.94	57.64	18.70
6/1	Royal Artillery, Scottish Division	1	15	12	1	-	1	3	1.61	800.0	66.66	200.00	107.33	39.17	48.90
9/1	Royal Artillery, North Irish Division	-	67	102	1	1	2	10	5.86	1522.4	26.86	149.25	87.46	31.90	20.97
9/1	Royal Artillery, North Irish Division	1	9	14	1	-	1	-	.94	1525.6	111.11	-	104.44	38.12	24.50

Brigade or Battalion.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sick- ness.	
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- vali- dated.	Con- stantly Sick.			
EGYPT—cont.																
1/1	Royal Artillery, South Irish Division	3	27	26	—	1	1	—	1.76	963.9	37.03	—	63.18	days.	23.79	24.70
2/1	Royal Artillery, South Irish Division	—	79	100	3	—	3	9	6.26	1291.1	25.31	113.98	77.97	28.92	22.85	
2/1	Royal Artillery, South Irish Division	—	7	16	—	—	—	—	.99	2235.8	—	—	141.43	51.62	22.58	
K/1	Royal Artillery	—	—	1	—	—	—	1	.03	—	—	—	—	—	10.95	
	Royal Artillery, Reserve Depot	—	16	30	—	—	—	4	1.71	1875.0	—	250.00	106.87	39.00	20.80	
	Royal Engineers	3	250	341	9	1	10	51	20.52	1364.0	40.00	204.00	82.04	39.55	21.96	
	Royal Engineers	3	70	75	4	—	4	—	4.31	1071.4	57.14	—	61.57	22.47	20.97	
	Royal Engineers	—	20	44	1	1	2	27	1.17	2200.0	100.00	1350.00	55.50	21.35	9.70	
3rd	Grenadier Guards	—	67	116	3	1	4	54	2.15	1432.8	59.69	805.97	32.08	11.71	6.53	
1st	Coldstream Guards	—	78	115	5	2	7	47	2.10	1487.1	89.90	602.56	26.92	9.83	6.66	
2nd	Scots Guards	—	82	133	3	—	3	26	3.00	1631.9	36.58	517.07	36.58	13.35	8.23	
2nd	East Kent Regiment	—	23	29	—	—	—	2	1.76	1260.8	—	86.96	76.53	27.93	22.15	
1st	Royal Fusiliers	—	22	19	—	—	—	—	.66	863.6	—	—	30.00	10.96	12.67	
1st	Royal Irish Regiment	1	199	298	4	—	4	46	9.93	1487.5	20.10	231.10	46.89	18.21	12.24	
1st	Yorkshire Regiment	1	150	203	3	—	3	17	17.83	1366.6	20.00	113.33	118.86	43.38	31.74	
1st	Yorkshire Regiment	1	206	347	12	—	12	—	14.24	1684.5	58.25	—	60.12	25.23	14.97	
2nd	East Surrey Regiment	—	292	313	6	3	9	45	18.33	1071.9	30.81	147.96	62.77	22.91	21.37	

Battalion.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- val- idated.	Con- stantly Sick.		
EGYPT—cont.															
2nd	Duke of Cornwall's Light Infantry -	3	378	712	4	—	4	26	31.21	1883.3	10.58	78.78	82.56	30.13	16.00
1st	Royal Sussex Regiment -	3	111	129	1	1	2	28	7.53	1162.1	18.03	252.25	68.28	24.02	21.44
2nd	Royal Sussex Regiment -	—	740	1363	12	1	13	98	67.65	1841.9	17.24	132.43	91.42	33.36	18.11
2nd	Royal Sussex Regiment -	—	14	22	—	—	—	—	41	1571.4	—	—	23.28	10.09	6.80
1st	South Staffordshire Regiment -	2	33	108	1	2	3	19	7.50	3272.7	13.57	575.75	227.27	82.92	25.34
1st	South Staffordshire Regiment -	3	188	251	—	—	—	—	11.11	1335.1	—	—	59.09	21.57	16.15
1st	Dorsetshire Regiment -	—	22	14	—	—	—	—	25	63.6	—	—	11.36	4.14	6.51
1st	Royal Highlanders -	3	421	534	6	—	6	19	29.90	1268.4	14.25	43.13	71.02	25.92	20.43
2nd	Oxfordshire Light Infantry -	—	687	967	18	—	18	78	55.61	1387.3	25.82	111.91	79.78	20.12	20.04
1st	Essex Regiment -	1	1	1	—	—	—	—	08	1000.0	—	—	80.00	29.20	29.20
2nd	Essex Regiment -	1	455	622	6	2	8	32	34.34	1367.0	17.58	70.33	75.47	27.74	20.15
1st	Royal Berkshire Regiment -	1	474	467	6	—	11	55	27.02	1027.4	21.48	116.03	50.56	20.80	20.25
1st	Royal Berkshire Regiment -	3	38	60	1	—	—	—	6.33	1579.0	—	—	166.58	60.80	38.60
1st	Royal West Kent Regiment -	3	201	190	3	—	4	—	13.50	945.3	—	—	67.16	24.51	25.03
1st	Royal West Kent Regiment -	3	40	114	—	—	4	20	9.12	2850.0	16.60	500.00	228.00	83.22	29.20

Brigade or Battalion.	Corps and Commands.	Completed Years of Service in Foreign Commands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sickness.
					In the Command.	Of Invalids.	Total.			Admitted.	Died.	Invalids.	Constantly Sick.		
EGYPT—cont.															
1st	Shropshire Regiment	—	143	491	3	3	31	27	19.75	3457.8	77.11	190.14	139.09	50.76	14.68
1st	Shropshire Regiment	—	260	646	25	—	6	100	25.07	2464.6	—	576.92	94.22	35.19	14.29
3rd	King's Royal Rifle Corps	3	320	233	5	1	6	7	15.90	725.0	18.74	21.87	49.68	18.19	25.01
2nd	Durham Light Infantry	—	646	983	4	—	4	74	44.81	1708.7	7.32	135.53	82.07	29.95	17.53
2nd	Durham Light Infantry	—	11	41	2	—	2	—	1.72	3727.3	181.82	—	156.87	87.07	16.31
1st	Gordon Highlanders	2	153	288	4	—	4	31	13.89	1960.5	28.31	203.94	91.38	33.39	17.01
1st	Cameron Highlanders	3	163	165	1	—	1	—	6.62	950.9	6.13	—	40.61	14.82	15.58
1st	Cameron Highlanders	2	25	94	3	—	3	15	5.62	3760.0	130.00	720.00	224.80	88.03	21.82
1st	Royal Dublin Fusiliers	—	27	42	—	—	—	—	1.20	1555.5	—	—	44.44	16.22	10.42
2nd	Royal Dublin Fusiliers	—	733	1,024	16	1	17	73	67.86	1398.9	23.22	99.72	92.03	33.45	24.01
—	Mounted Infantry	—	54	95	1	—	1	2	4.16	1759.2	18.51	37.03	77.03	23.11	15.98
—	Mounted Infantry	—	48	80	4	—	4	14	2.38	1666.6	83.33	291.66	49.58	18.09	10.86
—	Mounted Infantry	3	8	24	—	—	—	—	.57	3000.0	—	—	71.25	26.00	8.66
—	Commissariat and Transport Corps	3	123	115	7	5	14	14	6.67	935.3	94.59	113.82	54.22	19.85	31.17
—	Commissariat and Transport Corps	3	25	34	2	—	—	—	1.87	1360.0	—	—	74.80	27.30	20.07

Battalion.	Corps and Commands.	Com- pleted Years of Service in Foreign Com- mands.	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sick- ness.
					In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- val- idated.	Con- stantly Sick.		
	EGYPT—cont.													days.	days.
	Medical Staff Corps	3	245	329	5	2	7	62	16.35	1342.8	253.06	66.73	24.35	18.13	
	Medical Staff Corps	3	27	17	—	—	—	—	1.03	639.6	—	38.14	13.92	22.11	
	Ordnance Store Corps	3	133	190	2	1	4	19	6.87	909.1	14.39	52.04	18.99	20.89	
	Ordnance Store Corps	3	23	24	1	—	—	—	1.03	1090.9	—	46.81	17.08	15.66	
	Staff and Departments	—	58	172	7	—	7	68	6.90	2365.5	120.68	1172.41	45.42	14.64	
	General Staff	3	14	16	1	—	1	8	.83	1143.8	71.43	53.57	21.37	18.70	
	Military Staff Clerks	3	1	2	—	—	—	—	.16	2000.0	—	160.00	53.40	29.20	
	Military Police	—	67	38	1	—	1	1	5.89	567.1	14.92	86.42	32.06	56.57	



Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.			
E/A Royal Horse Artillery	161	280	—	3	13.08	1739.1	—	18.63	81.24	29.68	Lucknow, 10½ months; Camp of Exercise, Delhi, ½ month; march, 1 month.	9 0
F/A "	159	336	5	4	15.60	2115.2	31.45	25.16	98.11	35.81	Meerut, 11 months; Camp of Exercise, Umballa, ½ month; march, ½ month; Depot, Meerut, 1 month.	10 0
G/A "	172	332	1	11	15.55	1680.2	5.81	63.95	90.41	33.00	Meerut, 11 months; Camp of Exercise, Delhi, ½ month; march, ½ month.	10 0
L/A "	145	376	1	10	13.47	2663.1	6.90	68.97	92.90	33.91	Umballa, 16 months; Base Hospital, Rawal Pindi, 1 month; Camp of Exercise, Umballa, ½ month; march, ½ month.	9 0
K/B "	147	160	2	3	8.65	1068.4	13.61	20.41	58.64	21.46	Rawal Pindi, 12 months; Dett. Bara Gully, 3 months; Dett. Gharial, 5 months.	5 0
N/B "	165	227	1	4	8.38	1375.3	6.06	24.24	50.79	18.64	Umballa, 7½ months; march, ½ month.	8 0
A/1 Royal Artillery	151	216	1	8	9.82	1480.5	6.62	53.98	66.03	23.74	Dinapore, 11 months; Camp of Exercise, Delhi, ½ month; march, ½ month.	2 1½
B/1 "	149	263	—	10	11.30	1765.1	—	67.11	78.64	27.68	Moolan, 12 months.	5 0
G/1 "	165	225	2	5	10.25	1363.6	12.12	30.30	62.12	22.67	Cawnpore, 12 months.	5 0
1/1 Eastern Divn.	92	122	1	1	5.46	1326.1	10.87	10.87	59.36	21.66	Rawal Pindi, 4 months; Kalabagh, 5 months; march, 3 months; Dett. Khayra Gully, 3 months.	1 2
1/1 London Divn.	88	85	1	—	3.15	985.9	11.36	—	35.90	13.07	Campbellpore, 11 months; Field Hospital, Rawal Pindi, 1 month.	1 2
2/1 Scottish Divn.	28	21	—	—	1.12	760.0	—	—	40.00	14.60	Rawal Pindi, 3½ months.	1 5
3/1 Scottish Divn.	91	139	2	1	8.07	1527.5	21.98	10.99	88.68	32.87	Calcutta, 10 months.	1 1½
4/1 Lancashire Divn.	102	243	2	7	11.04	2332.4	19.61	68.63	108.24	39.51	Fort Lahore, 12 months; Dett. Amritsar, 10 months.	6
5/1 "	100	148	2	3	7.07	1480.0	20.00	30.00	70.70	25.81	Fortress Gwalior, 12 months.	10 0
5/1 Southern Divn.	20	14	—	4	2.19	700.0	—	200.00	169.50	38.97	Agra, 2 months.	9 2

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Duration of each Case of Sickness.	Stations occupied during the Year.		Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
5/1 Western Divn.	-	157	1	-	6.04	1632.6	-	-	63.58	23.21	Perozapore, 10½ months	-	Yrs. mo. 6 10½
5/1 Welsh Divn.	-	168	1	3	5.69	1747.4	10.53	31.58	59.80	21.86	Port Allahabad, 10 months	-	0 10
6/1 Southern Divn.	-	18	-	3	.99	1088.8	-	176.47	58.24	21.26	Port Allahabad, 2 months	-	9 2
7/1 Northern Divn.	-	140	-	3	6.10	1806.4	-	32.26	65.50	23.91	Umballa, 1½ months; Juteogh, 8½ months; Camp of Exercise, Delhi, ½ month; march, 1½ months.	-	8 0
7/1 Eastern Divn.	-	127	1	3	6.21	1607.6	12.66	37.97	78.61	28.69	Campbellpore, 9 months; march, ½ month; Dett. Fort Attock, 9 months; Dett. Kalabagh, 5 months.	-	0 9½
7/1 Southern Divn.	-	175	1	3	8.44	1944.4	11.11	33.33	93.78	34.23	Morar, 10½ months; Camp of Exercise, Delhi, ½ month; march, ½ month.	-	10 0
7/1 Cinque Ports Divn.	-	20	-	-	1.06	2000.0	-	-	103.00	38.32	Delhi, 1 month	-	0 1
8/1 Northern Divn.	-	192	1	5	14.25	1745.5	9.09	45.46	129.55	47.28	Campbellpore, 1½ months; Agra, 10½ months	-	7 0
9/1 Eastern Divn.	-	382	-	9	11.40	3679.2	-	93.75	118.75	43.31	Delhi, 10 months; Calcutta, 2 months.	-	1 9½
9/1 Cinque Ports Divn.	-	116	2	2	6.15	1450.0	25.00	25.00	76.87	28.06	Rawal Pindi, 4½ months; Khayra Gully, 5 months-	-	2 7½
J/2 Royal Artillery	-	219	-	3	10.36	1610.6	-	20.60	71.38	26.06	Rawal Pindi, 8½ months; Camp of Exercise, Dett. Ghatal, 7 months.	-	8 0
R/2 " "	-	161	3	-	4.99	1025.5	19.11	-	31.78	11.60	Umballa, ½ month; march, 2½ months; Dett. Jullundur, ½ month; Field Hospital, Rawal Pindi, ½ month; Camp of Exercise, Delhi, ½ month; march, 2 months; Depot, Jullundur, 2 months.	-	8 0
R/3 " "	-	376	-	7	16.26	2425.8	-	45.15	104.90	39.29	Morar, 12 months	-	5 0
L/3 " "	-	358	1	3	15.82	2613.1	7.30	21.90	115.47	42.15	Meerut, 1½ months; Camp of Exercise, Delhi, ½ month; Depot, Meerut, ½ month.	-	6 0
M/3 " "	-	371	1	8	19.60	2234.9	6.02	48.19	118.67	43.10	Peshawar, 1½ months; Field Hospital, Rawal Pindi, ½ month; Dett. Cherat, ½ months.	-	5 0



Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hosp.	Deaths.	Invalids.	Average Daily Sick.				
N's Royal Artillery	140	402	1	4	15.85	2698.0	6.71	26.85	106.98	38.83	14.39	Meeran Meer, 10 months; Camp of Exercise, Umballa, 1 month; march, 1 month.	5 0
O/S	147	172	1	3	8.98	1170.1	6.90	20.41	61.09	22.30	19.06	Lucknow, 12 months.	5 0
P/S	189	347	3	6	16.62	2182.4	18.87	37.74	104.53	38.15	17.48	Meeran Meer, 9 months; Field Hospital, Rawal Pindi, 1 month; Camp of Exercise, Umballa, 1 month; march, 2 months.	9 0
Q/S	171	196	1	—	9.84	1146.2	5.85	—	57.54	21.00	18.32	Saugor, 12 months.	9 0
R/S	141	166	—	4	8.27	1177.3	—	28.37	58.65	31.41	18.18	Pyrabad, 12 months.	9 0
B/4	160	338	2	5	17.14	2112.5	12.50	31.25	107.13	39.10	18.51	Meerut, 11 months; Camp of Exercise, Umballa, 1 month; march, 1 month; Depot, Meerut, 1 month.	12 0
C/4	182	339	2	1	11.54	1572.4	13.16	6.58	75.92	27.71	17.62	Nowgong, 12 months.	12 0
D/4	123	194	1	3	9.99	1577.2	8.13	24.39	81.23	29.65	18.80	Agra, 11 months; Camp of Exercise, Delhi, 1 month; march, 1 month.	12 0
E/4	155	209	2	8	15.38	1346.4	12.90	51.61	99.23	36.22	28.86	Bareilly, 10 months; Camp of Exercise, Umballa, 1 month; march, 1 month.	12 0
F/4	146	412	2	5	16.34	2793.8	13.51	33.78	110.41	40.30	14.48	Morar, 12 months.	12 0
G/4	155	322	6	—	15.73	2077.4	38.71	—	101.46	37.04	17.83	Allahabad, 9 months; Camp of Exercise, Delhi, 1 month; march, 1 month.	12 0
L/4	155	237	—	2	9.28	1529.0	—	12.90	59.87	21.85	14.29	Ferozepore, 11 months; Camp of Exercise, Umballa, 1 month; march, 1 month.	9 0
O/4	155	220	1	3	7.82	1419.4	6.45	19.35	47.23	17.24	12.14	Barrackpore, 10 months; Camp of Exercise, Delhi, 1 month; march, 1 month.	9 0
Total	5,687	9,781	55	171	446.41	1750.7	9.84	30.61	79.90	39.16	16.66	Roorkee, 12 months.	18 0
H. Coy., Royal Engineers	42	47	1	5	1.28	1119.0	23.81	119.06	30.46	11.12	9.94		

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Time to each Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hos.	Deaths.	Invalids.	Average Daily Sick.				
INFANTRY.													
2nd R. W. Surrey Regiment	872	994	15	7	46.48	1180.9	17.20	8.03	53.30	19.46	17.07	Cawnpore, 10 months; Calcutta, 2 months; Dett. Barrackpore, 2 months.	8 0
Half Bn. "	41	39	—	—	1.50	951.2	—	—	36.59	13.35	14.04	Dum Dum, 2 months	8 0
2nd Northumberland Fusiliers	682	1,295	16	11	60.91	1898.8	23.46	16.13	89.31	32.60	17.17	Measn Meer, 10 months; Camp of Exercise, Umballa, 1 month; march, 1½ months; Dett. Fort Lahore, 10 months.	6 0
2. d R. Warwickshire Regt.	875	1,080	7	5	52.54	1234.3	8.00	5.71	60.05	21.92	17.76	Jubbulpore, 11 months; march, 1 month; Dett. Saugor, 10½ months.	8 0
2nd Liverpool Regiment	563	1,003	5	7	47.66	1772.1	8.83	1.37	84.20	30.73	17.34	Calcutta, 10 months	8 10
2nd Norfolk Regiment	401	966	10	10	40.80	1967.4	20.37	20.37	83.10	30.33	15.42	Sitapur, 12 months; Dett. Chunar, 6 months	12 0
Half Bn. "	379	841	8	4	29.76	2366.5	22.23	11.14	81.23	29.65	12.58	Benares, 11½ months	12 0
2nd Lincolnshire Regiment	883	1,605	13	8	73.95	1885.0	15.86	9.06	83.75	30.57	16.21	Morar, 12 months	4 0
2nd Devonshire "	869	1,313	2	2	45.87	1510.9	2.30	2.30	82.78	19.27	12.75	Jhansi, 12 months; Dett. Fortress Gwalior, 12 months.	9 0
1st Suffolk "	570	1,353	10	24	50.44	2552.8	18.87	43.28	95.17	34.74	13.61	Roorkee, 12 months	10 0
Half Bn. "	380	1,576	9	24	34.27	4390.0	25.07	66.85	95.46	34.84	7.94	Delli, 12 months	10 0
2nd W. Yorkshire "	635	1,122	4	13	48.92	1713.0	6.11	19.85	74.69	27.26	15.91	Sialkot, 10 months; Camp of Exercise, Umballa, 1 month; march, 1½ months; Dett. Amritsar, 12 months; Depot, Sialkot, 2 months.	8 0
2nd Leicestershire "	868	1,132	12	2	56.16	1304.1	13.82	2.30	64.70	23.62	18.11	Jubbulpore, 11 months; march, 1½ months; Dett. Saugor, 11 months.	10 0
2nd Royal Irish "	656	702	12	14	31.55	1070.1	18.29	21.34	48.09	17.55	16.40	Umballa, 11 months; Field Hospital, Rawal Pindi, 1 month; Subathu 7½ months; Camp of Exercise, Umballa, 1 month; march, 1 month; Dett. Jutogh, 11 months; Depot, Subathu, 1 month.	0 11

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Time to Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hosp.	Deaths.	Invalids.	Average Daily Sick.				
2nd Cheshire Regiment	887	1283	10	4	40.48	1390.1	11.27	4.51	48.64	16.66	11.98	Umballa, 3½ months; Field Hospital, Rawal Pindi, 1 month; Solon, 6 months; Camp of Exercise, Delhi, ½ month; march, 1 month; Dett. Dasgah, 1½ months.	13 9
1st B. W. Fusiliers	702	873	12	11	51.29	1243.6	17.06	15.67	73.06	26.67	21.44	Dum Dum, 10 months; Dett. Barrackpore, 10 months.	5 10
1st K. O. Borderers	847	2,140	16	13	100.81	2593.6	18.89	15.35	119.03	43.44	17.19	Meerut, 11½ months; Camp of Exercise, Delhi, ½ month; Dett. Fatehgarh, 11 months; Depôt, Meerut, ½ month.	11 0
1st East Lancashire Regiment	699	2,028	5	22	70.05	2901.3	7.15	31.47	100.21	38.58	12.61	Perozepore, 12 months; Dett. Amritsar, 2 months	6 0
1st W. Riding Regiment	910	1,181	4	12	57.59	1297.8	4.40	13.19	63.20	23.10	17.80	Rawal Pindi, 4 months; Kuldannah, 3½ months; Camp of Exercise, Umballa, ½ month; march, 14 months; Dett. Camp Topa, 5½ months.	11 0
1st Border Regiment	791	1,631	7	27	76.29	2061.9	8.85	34.13	96.45	35.20	17.07	Agra, 11 months; Camp of Exercise, Delhi, ½ month; march, ½ month; Depôt, Agra, 1 month.	12 0
1st South Yorkshire Regiment	867	1,235	11	17	53.63	1424.5	12.69	19.61	61.86	22.58	15.85	Dinapore, 13 months; Dett. Chunar, 6 months	14 0
2nd Dorsetshire	814	1,315	12	16	63.53	1615.5	14.74	19.66	78.11	28.51	17.65	Peshawar, 6½ months; Cherat, 5 months; march, ½ month; Dett. Changla Gully, 5½ months.	15 0
4th King's Royal Rifle Corps	871	1,535	8	5	56.43	1762.3	9.18	5.74	64.79	23.65	13.42	Peshawar, 11½ months; march, ½ month; Dett. Cherat, 5½ months.	9 0
1st Durham L. Infantry	616	1,217	8	5	47.93	1075.6	12.99	8.12	77.84	28.41	14.38	Allahabad, 12 months; Dett. Fatehgarh, 1 month.	14 0
1st East Surrey Regt.	681	680	3	3	39.32	908.5	4.41	4.41	57.74	21.07	21.11	Ranikhet, 8½ month; Camp of Exercise, Delhi, ½ month; march, 1½ months.	0 104
Half Bn.	49	62	—	1	5.60	1265.3	—	20.41	116.12	42.38	33.50	Bareilly, 1 month.	0 104
2nd Highland L. Infantry	853	987	7	3	42.42	1157.1	8.21	3.52	46.73	18.15	15.60	Umballa, 2½ months; Field Hospital, Rawal Pindi, 1 month; Dasgah, 7 months; Camp of Exercise, Delhi, ½ month; march, 1 month; Depôt, Umballa, 1 month.	1 2
2nd Seaforth Highlanders	819	1,401	7	15	70.80	1820.5	8.55	18.32	86.56	31.59	17.35	Lucknow, 2½ months; Bareilly, 7½ months; Base Hospital, Rawal Pindi, 1 month; Camp of Exercise, Delhi, ½ month; march, ½ month; Dett. Moradabad, 7½ months.	5 0

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Daily Sick.				
1st Royal Irish Fusiliers	909	969	16	13	51.51	1066.0	17.60	14.30	56.67	20.08	19.40	Rawal Pindi, 10 months; Camp of Exercise, Umballa, 4 month; march, 14 month; Dett. Gharial, 5 months.	yrs. mo. 2 1 $\frac{1}{2}$
1st Connaught Rangers	636	1,024	11	12	45.31	1610.1	17.30	18.87	71.24	26.00	16.15	Barcelly, 4 month; Jullundur, 8 months; Camp of Exercise, Umballa, 3 month; march, 24 months; Dett. Dagshai, 74 months; Dett. Bhagsu, 54 months; depot, Jullundur, 2 months.	7 0
2nd Scottish Rifles	451	720	5	7	28.76	1506.5	11.09	15.52	63.77	23.28	14.58	Barcelly, 4 months; Chaubuttia, 64 months; Camp of Exercise, Delhi, 4 month; march, 1 month.	7 0
Half Bn. " Derbyshire Regiment	261	350	4	—	15.15	1341.0	15.33	—	58.05	21.19	15.80	Shahjehanpur, 12 months	7 0
2nd Derbyshire Regiment	870	1,198	11	11	58.41	1377.0	12.64	12.64	67.13	24.51	17.80	Lucknow, 10 months; Camp of Exercise, Umballa, 3 month; march, 14 months.	3 2
2nd Manchester Regiment	844	1,415	10	44	65.24	1676.5	11.85	52.13	77.30	28.21	16.83	Mooltan, 9 months; Field Hospital, Rawal Pindi, 1 month; Camp of Exercise, Umballa, 4 month; march, 14 months; Depot, Mooltan, 3 months.	3 13
2nd Wiltshire "	819	1,268	14	8	53.25	1548.2	17.09	9.77	65.02	23.73	15.33	Nowsheera, 114 months; Peshawar, 4 month; Dett. Fort Attock, 114 months; Dett. Cherat, 6 months.	3 1
1st Leinster 4th Bn. Rifle Brigade	804	1,082	7	24	62.76	1345.8	8.71	29.85	78.06	28.49	21.17	Fyzabad, 12 months	9 0
	933	1,194	9	16	44.70	1279.7	9.65	17.15	47.91	17.46	13.66	Meerut, 14 months; Field Hospital, Rawal Pindi, 1 month; Rawal Pindi, 14 months; Chakrata, 6 months; Camp of Exercise, Delhi, 4 month, march, 14 months; Depot, Chakrata, 1 month.	13 0
Total	25,639	41,914	321	429	1821.72	1634.8	12.52	16.38	71.05	25.93	15.86	Various station hospitals.	
Men Attached (Corps, not stated), Garrison Staff and Departments.	342	266	6	—	11.26	777.8	17.54	—	32.92	12.02	15.45	Various station hospitals.	
Grand Total	36,101	57,590	457	715	2568.24	1640.2	13.02	20.37	73.17	26.71	16.19		

ABSTRACT No. XLIV.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the ADMISSIONS, MORTALITY, and INVALIDING in each CORPS serving in the MADRAS COMMAND for the Year 1885.

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.					Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hos- pital.	Deaths.	Invalids.	Average Constantly Sick.	Average Time to each Soldier.			
CAVALRY.													
12th Lancers	431	568	1	10	26	1387.47	2.32	23.20	60.33	22.02	15.87	Bangalore	- - 12 9 0
14th Hussars	457	414	5	7	26	905.91	10.94	15.33	56.89	20.77	22.92	Secunderabad	- - 12 4 0
Total	888	1,012	6	17	52	1139.64	6.76	19.14	58.56	21.37	18.75		
ROYAL ARTILLERY.													
E/R Bde. Royal Horse Artillery	135	113	2	3	6	837.04	14.81	23.22	44.44	16.23	19.38	Bangalore, 10; and left for England 10th Nov. 1885.	11 10
H/B "	18	30	-	-	1	1666.67	-	-	55.56	20.28	12.16	Secunderabad, 1; (arrived from England, 7th Nov. 1885).	0 2
M/B "	139	192	2	6	11	1207.55	12.58	37.74	69.18	25.25	20.91	Secunderabad, 10; on the march 1 and Ban- galore, 1.	8 0
D/1 " Royal Artillery	143	185	1	4	12	1283.71	6.99	27.97	83.91	30.63	23.67	Secunderabad	- - 12 3 0
P/1 "	127	155	-	6	9	1220.47	-	47.24	70.86	25.70	21.19	St. Thomas' Mount	- - 12 6 0
Q/1 "	143	162	3	8	12	1132.87	20.99	55.94	83.92	30.63	27.03	St. Thomas' Mount, 10; and left for field ser- vice, Bournah.	7 0
R/1 "	130	211	-	5	12	1517.99	-	38.97	86.33	31.51	20.76	Bellary, 11; and on the march to Belgaum, 1	7 0
S/1 "	159	189	-	3	7	874.21	-	18.87	44.03	16.07	18.38	Bangalore	- - 12 6 0
U/1 "	145	169	1	3	8	1165.62	6.89	20.69	55.17	20.13	17.28	Kamptee	- - 12 1 0
G/2 "	18	9	1	-	1	500.00	55.56	-	55.56	20.28	40.55	Belgaum, 1; 1	11 0

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Constantly Sick.				
M/2d Bde. Royal Artillery	132	109	—	1	5	717.11	—	6.58	32.90	11.97	16.74	Bangalore	months, yrs. mo. — 12 7 0
I/3d " "	144	225	1	6	14	1562.50	6.94	41.67	97.22	35.49	23.71	Secunderabad	— — — 12 6 0
4/1 Welsh Division, R.A.	88	94	—	4	5	1068.18	—	45.45	56.62	20.74	19.41	Secunderabad	— — — 12 6 0
5/1 " "	8	9	—	—	—	1125.00	—	—	—	—	—	St. Thomas' Mount, 1; and left for Allahabad	5 0
4/1 North Irish Div. "	70	54	—	1	4	771.45	—	14.29	57.14	20.85	27.04	St. Thomas' Mount and Madras, 10; and left for field service, Burmah.	4 0
6/1 South Irish Div. "	104	143	3	3	7	1375.00	19.23	28.85	67.31	24.57	17.87	Thayetmyo, 10; and left for Aden	10 0
8/1 London Division "	101	142	3	2	8	1405.94	23.70	19.80	79.21	28.91	20.56	Toungoo	— — — 12 10 0
5/1 Southern Division "	87	203	—	—	8	2353.33	—	—	91.95	33.56	14.33	Thayetmyo, 91; arrived from Bengal 9th Mar. 1885.	9 0
9/1 " "	99	98	3	1	5	989.90	30.30	10.10	50.50	18.43	18.62	Rangoon, 10; arrived from Allahabad 26th Feb. 1885.	—
7/1 Eastern Division "	16	12	—	—	—	750.00	—	—	—	—	—	Thayetmyo, 21; and left for Bengal Presidency.	5 0
Detalla, R.A. "	31	10	—	—	1	822.58	—	—	32.23	11.77	38.50		
Total	2,096	2,464	19	56	136	1181.21	9.11	26.85	65.13	23.80	20.15		
ROYAL ENGINEERS.													
2nd Coy., Royal Engineers	44	19	—	—	1	431.82	—	—	22.73	8.29	19.21	Bangalore	— — — 12 —

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.				Average Time to Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hos.	Deaths.	Invalids.	Average Constantly Sick.				
INFANTRY.													
2nd Bn. Roy. Fusiliers C. L. Regiment.	867	915	12	19	58	1055.36	13.84	21.91	66.90	24.42	23.14	Cannanore (detachment at Calicut) -	months. yrs. mo. - 12 13 0
2nd Bn. P. A. Somersetshire Light Infantry.	697	719	5	12	33	1031.56	7.17	17.22	47.35	17.26	16.75	Rangoon -	- 12 7 0
2nd Bn. Bedfordshire Regt. -	864	1,189	5	9	69	1387.73	5.79	10.42	79.83	29.14	21.01	On the march, 3; and Bellary, 11½	- 10 0
2nd Bn. Royal Scots Fusiliers Headquarters.	489	624	8	6	29	1276.07	16.36	12.27	59.80	21.64	16.96	Thayetmyo -	- 12 4 0
2nd Bn. Royal Scots Fusiliers Wing.	293	436	3	1	19	1513.88	10.43	3.47	65.97	24.03	15.91	Toungoo -	- 12 4 0
2nd Bn. South Wales Borderers.	713	813	3	16	52	1140.25	4.21	22.44	72.93	26.62	23.34	Madras (detachment at Malaporam and Port Blair) -	- 12 5 0
2nd Bn. Hampshire Regiment	714	820	11	15	46	1166.86	15.41	21.01	64.43	23.52	20.33	On the march, 1½; Secunderabad, 8½; and left for field service, Burmah.	13 0
1st Bn. Oxfordshire Light Infantry.	233	214	1	13	13	918.45	4.29	55.79	55.79	20.37	22.17	Bangalore, 3½; and left for Quetta, 10th April 1885.	13 0
2nd Bn. Middlesex Regiment	810	904	5	23	54	1116.06	6.17	28.39	66.66	24.33	21.80	Secunderabad -	- 12 5 0
2nd Bn. Royal Munster Fusiliers	894	995	4	17	46	1112.88	4.47	19.01	51.45	18.78	16.87	Kamptee (detachment at Sutu buldee) -	- 12 3 0
1st Bn. Rifle Brigade -	103	76	-	-	4	737.86	-	-	38.83	14.17	19.21	Belgaum, 1½	- 5 0
Details of Infantry -	64	62	-	-	3	968.75	-	-	46.87	17.11	17.66	-	-
Total -	6,736	7,763	57	131	426	1155.43	8.46	19.45	63.24	23.08	19.98	-	-

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Number Constantly Sick.	Ratio per 1,000 of Strength.					Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hospital.	Deaths.	Invalids.	Average Constantly Sick.	Average Time to Sick Soldier.			
CONVALESCENT DEPÔTS.													
Poonamallee - - -	118	226	6	35	24	1915.25	50.55	208.61	205.39	74.23	33.76		
Wellington - - -	308	516	5	12	44	1402.17	13.59	32.61	119.67	43.64	31.12		
Total - - -	426	742	11	47	68	1528.75	22.63	96.71	186.91	51.07	33.46		
Garrison, Staff, and Departments.	174	95	4	-	3	488.51	22.99	-	17.24	6.29	12.88		
Grand Total - - -	10,414	12,103	97	251	686*	1162.38	9.31	24.10	65.87	24.04	20.08		

\* Excluding convalescents and detained.



**A BSTRACT No. XLV.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the ADMISSIONS, MORTALITY, and INVALIDING in each CORPS serving in the BOMBAY COMMAND for the Year 1885.**

Corps.	Completed Years of Service in Command.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalids sent Home.	Average Number constantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.
							Admitted.	Died.	Invalided.	Constantly Sick.			
CAVALRY.													
7th Dragoon Guards	2	447	546	3	17	29.47	1221.5	6.71	38.03	65.93	24.05	19.70	Mhow, 12 months.
ROYAL ARTILLERY.													
D Battery, B Brigade R.H.A.	13	137	189	2	11	10.56	1379.6	14.60	80.29	77.08	28.10	20.39	Kirkee, 12 months.
E " 1 " R.A.	3	113	155	1	12	9.00	1371.7	8.85	106.19	79.64	29.07	21.19	" 11 "
F " 1 " "	3	129	199	—	8	7.74	1542.6	—	62.01	60.00	21.90	14.20	" 1 month; Ahmednagar, 11 months.
T " 1 " "	2	129	162	2	9	8.81	1178.3	15.50	69.77	63.29	24.93	21.15	" 12 months.
A " 2 " "	11	151	157	6	3	7.28	1039.7	39.73	19.86	48.21	17.60	16.88	Deesa, 12 "
B " 2 " "	11	151	242	1	3	12.13	1602.3	1.02	19.86	80.25	29.29	18.28	Mhow, 12 "
C " 2 " "	11	145	333	2	3	8.85	2434.5	13.79	27.69	61.03	22.28	9.13	Hyderabad, 12 months.
D " 2 " "	11	148	270	—	3	10.98	1824.3	—	20.27	74.19	27.07	14.84	Ahmedabad, 12 months.
E " 2 " "	11	154	207	2	2	10.61	1344.1	12.99	12.99	68.80	25.15	18.71	Karachi, 13 months.
F " 2 " "	11	112	133	1	7	7.11	2973.3	8.86	62.50	63.46	23.17	19.61	Nasirabad, 11 months.
G " 2 " "	11	128	111	1	5	6.96	867.1	7.81	39.06	53.74	19.62	22.62	Belgaum, 9 months.
A " 4 " "	12	153	323	2	3	10.55	2111.1	13.07	19.61	68.95	25.10	11.93	Neemuch, 12 months.

Corps.	Completed Years of Service in Command.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalids sent Home.	Average Number constantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Sick.	Average Duration of each Case of Sickness.	Stations occupied during the Year.
							Admitted.	Died.	Invalided.	Constantly Sick.			
9 Btlt., 1 Brgd., R.A., N. Dn.	7	81	204	9	0	8.43	2518.0	111.11	87.04	104.08	38.00	15.08	Quetta, 12 months.
7 " 1 " C.P. Dn.	4	93	202	4	8	8.47	2172.1	43.01	86.02	91.08	33.24	15.30	" 10½ "
8 " 1 " "	4	98	144	3	8	6.22	1469.4	50.61	30.61	63.47	23.16	15.76	Mhow, 12 "
1 " 1 " West Dn.	2 Mo.	22	12	—	—	0.45	545.4	—	—	20.45	7.46	13.68	Colaba, 2 "
5 " 1 " "	6	12	35	—	—	0.69	2916.6	—	—	57.50	20.99	7.19	Quetta, 1 month.
6 " 1 " "	13	90	118	—	10	5.71	1191.9	—	101.01	57.68	21.03	17.68	Aden, 11 months.
1 " 1 " Scot. Dn.	1 M.	17	20	1	—	1.05	1176.5	58.82	—	61.76	22.54	19.16	Colaba, 1 month.
2 " 1 " "	2	131	81	—	—	4.36	618.3	—	—	33.28	12.14	19.64	Quetta, 9 months.
9 " 1 " "	15	84	65	1	2	3.56	773.8	11.90	22.81	42.38	15.42	19.99	Colaba, 10 "
5 " 1 " N.I. Dn.	11	80	107	—	—	6.42	1292.2	—	—	72.13	26.33	21.90	" 11 " Aden, 1 month.
5 " 1 " S.I. Dn.	13	105	105	3	3	5.57	1000.0	28.57	28.57	52.99	19.36	19.36	Aden, 11 "
6 " 1 " "	13	9	17	—	—	1.69	1888.9	—	—	187.78	68.54	36.28	" 1 month.
Total	—	2,400	3,001	41	56	163.11	1446.2	16.46	39.36	65.51	33.91	16.53	Kirkee, 12 months.
Royal Engineers	—	41	24	1	1	1.20	545.4	23.37	22.73	27.27	9.85	18.25	

Corps.	Completed Years in Command.	Average Annual Strength.	Admitted Hospital. Into	Died.	Invalids sent Home.	Average Number constantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Sick Soldier.	Average Duration of Case of Sickness.	Stations occupied during the Year.
							Admitted.	Died.	Invalided.	Constantly Sick.			
INFANTRY.													
2nd Royal Lancaster Regiment	5	580	811	7	11	35.64	1398.3	20.07	18.96	61.45	22.43	16.04	Poona, 12 months.
2nd East Yorkshire Regiment	11	784	891	10	26	47.76	1136.5	12.75	33.61	60.92	22.23	19.56	Colaba, 12 "
2nd Lancashire Fusiliers	4	700	1,269	10	17	54.50	1603.7	13.61	22.37	71.71	26.00	15.62	Nasirabad, 12 months.
2nd Gloucestershire Regiment	5	890	1,312	8	24	60.46	1474.2	8.99	26.97	67.83	24.79	16.82	Poona, 6 months; Ahmednagar, 6 months.
1st Worcestershire Regiment	7	838	1,580	10	13	64.54	1885.4	11.93	15.51	77.01	28.11	14.91	Karachi, 12 months.
1st Oxford Light Infantry	14	633	1,316	82	8	64.90	2079.0	129.54	12.64	102.53	37.42	18.00	Quetta, 8 months.
1st South Lancashire Regt.	13	526	625	9	20	22.33	1188.2	17.11	38.02	42.45	15.40	13.04	Aden, 12 months.
1st Loyl. N. Lanc. Regiment	2	634	1,787	36	28	73.52	2318.6	56.78	44.16	115.96	42.32	15.01	Quetta, 12 months.
2nd North Stafford Regiment	5	737	1,023	11	15	43.79	1388.2	14.93	20.35	59.42	21.69	15.62	Mhow, 11 "
1st Rifle Brigade	5	695	636	7	20	46.39	915.2	10.07	23.78	66.75	24.36	26.62	Belgaum, 10 months.
Total	-	7,077	11,250	190	182	513.83	1589.6	26.85	25.71	72.60	26.50	16.67	
DEPÔTS, &c.													
Colaba Depôt	-	100	111	4	11	14.66	1110.0	40.00	110.00	146.60	53.51	48.21	Colaba.
Deolalee Depôt	-	365	530	7	-	13.25	1462.2	19.18	-	36.30	13.25	9.12	Deolalee.
Convalescents	-	72	136	1	18	6.57	1888.8	13.89	240.98	91.24	33.39	17.63	Purandhar.

Corps.	Completed Years in Service in Command.	Average Annual Strength.	Admitted into Hospital.	Died.	Invalids sent Home.	Average Number constantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.
							Admitted.	Died.	Invalided.	Constantly Sick.			
Depôts, &c.— <i>continued.</i>													
Convalescents	1	27	78	2	—	5.63	2888.9	74.07	—	208.51	76.11	26.41	Taragarh.
"	—	75	90	3	—	4.18	1200.0	40.00	—	55.73	20.34	16.95	Mount Abu.
"	—	8	9	—	—	.14	1125.0	—	—	17.50	6.39	5.08	Khandalla.
Garrison Staff and Departments	—	163	74	8	2	4.29	454.0	40.08	12.27	26.32	9.61	21.16	
Various Corps	—	169	153	8	9	9.99	906.2	47.38	53.31	59.17	21.58	23.83	
Troops on the March, &c.	—	528	285	9	—	7.93	539.8	17.05	—	15.01	5.48	10.16	
Military Prison	—	83	115	1	—	6.27	1383.5	12.05	—	75.54	27.57	19.90	
Rest Camp	—	2	3	2	—	.04	1500.0	1000.00	—	20.00	7.30	4.87	Khundwa.
Total	—	1,592	1,584	45	40	72.95	964.7	28.26	25.12	45.81	16.79	16.81	
Grand Total	—	11,650	17,005	280	338	780.56	1459.5	24.03	29.10	67.00	24.45	16.75	

ABSTRACT XLVI.—RETURN showing the COMPARATIVE SICKNESS, MORTALITY, and INVALIDING of MEN who have extended their service in India, and those who have not, stationed in the Bengal, Madras, and Bombay Presidencies during the year 1885.

	BENGAL.						MADRAS.						BOMBAY.*					
	Average annual strength.	Number admitted into Hospital.	Died in and out of Hospital.	Invalided to England.	Average number constantly Sick.		Average annual strength.	Number admitted into Hospital.	Died in and out of Hospital.	Invalided to England.	Average number constantly Sick.		Average annual strength.	Number admitted into Hospital.	Died in and out of Hospital.	Invalided to England.	Average number constantly Sick.	
Regimental, warrant, and non-commissioned officers and men who have extended their service in India.	5,638	6,119	45	89	233.60		1,843	1,142	5	24	57.22		2,048	1,918	22	34	94.99	
Ratio per 1,000 of strength.	—	1085.3	7.98	15.61	41.43		—	619.64	2.71	13.02	31.04		—	936.62	10.74	16.60	46.38	
Regimental, warrant, and non-commissioned officers and men whose service has not been extended.	28,073	48,746	387	626	2557.80		8,571	10,963	92	227	688.80		8,203	13,380	218	305	626.90	
Ratio per 1,000 of strength.	—	1809.6	15.23	24.01	86.60		—	1279.08	10.73	26.43	75.36		—	1631.21	26.55	37.15	76.37	
Totals of both classes.	31,711	54,865	442	714	2491.40		10,414	12,105	97	251	688.03		10,256	15,307	240	339	721.89	
Ratio per 1,000 of strength.	—	1730.2	13.94	22.52	78.57		—	1162.38	9.31	24.10	63.87		—	1492.46	23.40	33.06	70.38	

\* The strength and statistics of the men treated in the station hospital, Deoladee, Rest-Camp, Khundwa, and of troops on the line of march have not been included in this statement.

## APPENDIX No. 1.

**MEDICAL HISTORY OF THE FRONTIER FIELD FORCE ON  
ACTIVE SERVICE IN THE SOUDAN FROM 27<sup>TH</sup> NOVEMBER  
1885 TO 27<sup>TH</sup> JANUARY 1886.**

**By Surgeon-Major W. S. M. PRICE, Medical Staff.**

The period embraced by the accompanying returns is shown above. No decided offensive movement was made by our troops till the end of December 1885. Lieutenant-General Stephenson left Wady Halfa on December 27<sup>th</sup>, and proceeded south to Kosheh, our most advanced post, where a fort had been constructed. The garrison had been subjected to a galling fire for several days previously, which had caused numerous casualties, about 3 among officers, and 19 among men. Medical arrange-  
ments, move-  
ments of troops,  
&c.

I believe, just prior to the action on December 30<sup>th</sup>, that our extreme advanced post was the fortified village of Kosheh on the right bank occupied by the Cameron Highlanders and a battalion of black Egyptian troops. The enemy's most advanced post was a village on the right bank, a few hundred yards south of Kosheh, while the remainder of their fighting men occupied a succession of small villages southward along the bank of the river. The plan of action was to attack the enemy at daybreak of the 30<sup>th</sup> in force. Our force was divided into two brigades as follows :—

**1ST BRIGADE.****1st Brigade.**

Detachment of Camel Corps.  
1st Royal Berks Regiment.  
1st Royal West Kent Regiment.  
2nd Durham Light Infantry.  
Egyptian Camel Battery.  
Detachment Egyptian Camel Corps.  
1st Battalion Egyptian Infantry.

**2ND BRIGADE.****2nd Brigade.**

2/1 South Irish Division Royal Artillery.  
Detachment Camel Corps.  
1st Yorkshire Regiment.  
1st Cameron Highlanders.  
Detachment Egyptian Camel Corps.  
2nd Battalion Egyptian Infantry.

**CAVALRY BRIGADE.****Cavalry Brigade.**

20th Hussars.  
Mounted Infantry.  
Egyptian Cavalry.

The two brigades, the 1st leading, were ordered to march at 4.45 a.m. and 5.15 a.m. respectively, heading away from the river and inland of the enemy's position, they were then to wheel to their right, so as to endeavour to hem the enemy in between the attacking force and the river. As soon as the two brigades had got into position, the Cameron Highlanders were to make a direct attack on the enemy's front along the river bank from Kosheh.

Action of  
"Ginias."

I am informed that the enemy were completely taken by surprise, and that hostilities commenced about 6 a.m. or shortly after, the enemy being attacked on their right flank. Simultaneously with this flank attack, a direct attack on their front was made by the Cameron Highlanders, according to the programme laid down, and the combined attack of our troops resulted in the complete dispersion of the enemy after a brief stand. Fighting continued till 10 a.m., when the enemy were in full flight, chiefly along and under cover of the river bank. Some of the enemy made a stand in one of the villages, and were subsequently dislodged by our troops. A battalion of Egyptian troops co-operated with the Cameron Highlanders in the front attack on the village occupied by the enemy. The Egyptian troops behaved very well throughout. Four guns and 20 banners were captured, and the enemy's loss was large, including several of their leaders. Our losses during the day were:—

#### BRITISH TROOPS.

Casualties, &c.

1 officer killed.  
1 officer wounded.  
20 non-commissioned officers and men wounded.

#### EGYPTIAN TROOPS.

1 officer and 4 men killed.  
3 officers and 11 men wounded.

The Cavalry and 1st Brigade followed up the flying enemy, and several nuggurs containing grain and stores were captured. The "Lotus" did good work, co-operating in the attack, and subsequently in the capture of the nuggurs.

Medical arrange-  
ments,

The various hospitals from base to front were as follows:—

Assuan,	200 beds,	under	Brigade Surgeon Markey.
Korosko,	100	" "	Surgeon Major Martin.
Halfa,	150	" "	Brigade Surgeon Archer.
Sarras,	10	" "	Surgeon Rainsford.
Ambigole,	5	" "	" Dobson.
Akasheh,	25	" "	" Lucas.
Kosheh Fort,	25	" "	" Powell.
Movable Field			
Hospital,	50	" "	Surgeon-Major Brown.

A medical officer, with panniers, field companion, &c., was attached to each corps. The field hospital was divisible into 2 sections of 25 beds each.

At Akasheh material was available for 25 additional beds, if necessary; and between 30 and 40 patients could be sent down from thence, on alternate days, in carriages (railway) fitted up for stretchers, and in first-class carriages.

The bearer company marched into action in rear of the 2nd Brigade; the dressing station being established by Surgeon-Major Barrow, in rear of this brigade, in a convenient hollow, and was moved forward as occasion required. Surgeon Pinching with the collecting station moved forward in rear of the brigade. All the wounded were seen to, and moved off the ground by a little after noon.

Half the bearer company under Surgeon-Major Barrow accompanied the Cavalry and 1st Brigade in pursuit of the enemy. This bearer company was constituted of 25 camels for sick, viz., 9 prs. litters and 16 prs. cacolets, 24 camels for riding purposes for officers and men; 50 sick could be transported at one time.

Half the bearer company under Surgeon Pinching marched between Abri and Kosheh, a distance of about 13 miles. The reserve section of the field hospital was established at Abri on January 1st for reception of sick of cavalry and both brigades, the 2nd Brigade, with headquarters, having marched there on January 1st, 1886.

The sick were evacuated from Abri to Wady Halfa as follows:—

By bearer company from Abri to Kosheh.

From Kosheh to Sarkamatto by whale boats; from Sarkamatto to Dal by cacolets, litters, stretchers, &c., over the "portage"; from Dal to Akasheh by boats, and from thence by rail to Halfa. They remained one night at Sarkamatto, and one night at Akasheh. Evacuation of sick.

There were 33 admissions among officers out of an average strength of 264, 13 of these were for fevers (viz., 10 simple continued fever, and 3 enteric fever), 6 for dysentery, 1 for ophthalmic affection, 3 for respiratory affections, 6 for digestive disorders (5 diarrhoea), 1 for fracture, 3 for injuries in action. Diseases: Officers.

There were 3 deaths, one from dysentery, and 2 from injuries in action. The case of death from dysentery was Major —, 1st Battalion, Royal West Kent Regiment. He was admitted at Akasheh on 11th December, and transferred to Wady Halfa. The dysentery was complicated with jaundice. Post-mortem examination revealed very extensive ulceration of the great intestine, which contained large clots of blood. In the left lobe of the liver was an abscess about the size of a hen's egg, full of thick pus, and in the right several of smaller size.

Lieut. —, Cameron Highlanders, was wounded on the morning of Dec. 16th, during a demonstration from Kosheh Fort against the enemy; "the bullet entered the chest at the level of the 6th costal cartilage, which it just touched, then passing through the lung to the side, slightly inclining downwards, came out through the intercostal space, and penetrated the right arm behind the humerus at its lower third. He rallied a good deal after admission, and there was some hæmoptysis, which was not of long duration. Very severe pneumonia of right lung was developed, and he died on the morning of the 19th December. No post-mortem examination was made further than examining the extent of lung mischief. I found that the bullet passed through the lungs to a depth of one and a half inches, and the whole of the lower lobe was intensely inflamed, and the rest of the lung congested."

Lieut. —, Royal Berkshire Regiment, was killed in action at Giniss on December 30th; penetrating bullet wound through right temple; death was instantaneous.

Capt. —, Cameron Highlanders, was slightly wounded by a rifle shot in the left side of the abdominal wall on December 11th.

Major —, Cameron Highlanders, was also wounded on the morning of December 16th, in the left hand, the bullet shattering the end of the thumb, and passing through the left forefinger, smashing the first bone and head of "metacarpal bone." This officer was sent to England; the wound had nearly healed when he left the country.

There were 153 admissions for simple continued fever, but of these 25 are shown as "discharged otherwise"; the bulk of these cases were re-admitted as cases of enteric fever; it is very possible, and perhaps probable, that many of these cases of simple continued fever were mild cases of enteric fever. Diseases: Non-commissioned officers and men.  
S. C. fever.  
Enteric fever.

95 admissions and 17 deaths, giving an admission rate per 1,000 per annum of 103·6, and a death rate of 18·54. In the cases of the disease causing death, the usual bowel lesions were well marked, the spleen and mesenteric glands being enlarged in almost every case, and typical engorgement or ulceration of Peyer's patches being present.

In one case lung complication seems to have been the immediate cause of death, as the patient was progressing favorably till the lung disease supervened under which he sank. Post-mortem examination revealed "grey hepatization and prulent infiltration of the lung, and great enlargement of liver and spleen, the ulcers in Peyer's patches were healing."

In another case the patient was admitted "on 9th January and died on 21st January, the attack was marked by the usual symptoms, and in addition by paralysis of motion of left arm and leg. Post-mortem examination revealed an abscess about the size of a walnut in the brain substance beneath the anterior corner of the right lateral ventricle. Heart was fatty and hypertrophied; lungs somewhat congested but otherwise healthy; spleen and liver enlarged, and three patches of ulceration were discovered."

The medical officer at Assuan remarked on the prevalence of enteric fever among the 20th Hussars at North Camp, Assuan, but none of the medical officers have pointed out any definite causation for the disease.

17 deaths occurred in all from this disease, the average age being 24; only one death occurred over 30 years of age.



**Dysentery.**

This disease furnished a large number of admissions, 127; it seems to have been generally distributed throughout the different stations, though in many cases slight. Four deaths occurred, and the post-mortem examination showed extensive ulceration, congestion, &c. of the lower bowel. Two of the deaths took place at Akasheh, 1 at Assuan, 1 at Wady Halfa.

One of the cases which died at Akasheh was transferred from Firkeh; he was in a low, collapsed condition on admission, and never rallied.

The second case which proved fatal at Akasheh was that of a man of the Royal Berkshire Regiment. Post-mortem examination.—“Large intestine very congested and thickened in many places. Large perforating ulcer in the cæcum close to ileo-cæcal valve about 2 inches square. Extensive necrosis; large portion of mucous membrane converted into black rotten sloughs; contents of bowels discharged into peritoneal sac.”

The fatal case at Wady Halfa had been transferred from Akasheh and was that of a man of the 1st Royal West Kent Regiment. “Intestines normal, excepting ileum, which was studded with congested solitary glands, Peyer’s patches unaltered. The mucous surface of cæcum and large intestines covered with warty excrescences, and membranes congested, the excrescences in rectum were red and those above buff colour. Spleen large, soft, and pulpy. Liver and mesenteric gland normal; kidneys normal.”

**Paroxysmal fevers.**

14 admissions; these probably occurred among men who had inbibed the malarial poison elsewhere, and I have no reason for thinking they were of local origin; the majority of the cases occurred at Assuan, viz., 7 ague; the single case of remittent fever occurred at Korosko.

**Venereal diseases.**

Chiefly occurred at Assuan (37), Korosko (11), Halfa (19), in many cases contracted there in all probability, in other cases contracted before arrival at the station.

**Scurvy.**

Only one admission for this disease, which speaks well for the dietary and for the proper issue of lime, juice and its efficacy.

**Debility.**

12 cases were admitted for debility, perhaps the result of exertion, &c.

**Group D.**

24 cases occurred under this heading, chiefly rheumatic affections; the nature of a case of maglinant new growth is not specified. One case of tubercle of lung was admitted at Assuan, and was returned to duty.

**Local diseases: Nervous system.**

11 admissions under this heading, viz., neuralgia 7, epilepsy 4; one of the latter was said to have been induced by drink.

**Eye.**

52 admissions; of these 47 were for conjunctivitis, no ill-effects resulting; the remaining 5 were for day blindness, night blindness, iritis, and blepharitis.

**Circulatory system.**

Eight admissions, viz., 2 of valve disease of heart, 1 of palpitation, and 5 of diseases of veins.

**Respiratory system.**

55 admissions occurred, among them being 2 for laryngitis, 31 for bronchial affections, and 18 for pneumonia. Two deaths occurred, one from laryngitis and one from pneumonia.

The fatal case of laryngitis was that of Private —, Yorkshire Regiment. He was admitted into hospital at Korosko on January 18th; the symptoms were very urgent on admission, but were somewhat relieved by palliative treatment. Tracheotomy, however, had to be performed, and the patient died very soon after. The man had been under treatment some time previously for ulceration of the tonsils, probably specific, which had completely cicatrised. Post-mortem examination revealed “extensive œdema of the rima glottidis, congestion of the air tract and lungs, and large fibrinous clots on both sides of the heart.” The report does not state whether the clots were ante-mortem or post-mortem.

The fatal case of pneumonia was that of Private —, 2nd East Kent. Post-mortem examination revealed “complete solidification of right lung with much congestion of left.”

**Digestive system.**

184 admissions under this heading, the principal being sore throat, 16 cases; dyspepsia, 16; diarrhoea, 91; hepatitis, 7; jaundice, 15; abscess of liver, 1; and follicular tonsillitis, 17 cases.

There was one fatal case of abscess of the liver, Corporal —, Commissariat and Transport Corps, transferred from Akasheh on 15th December 1885 for abscess of the liver, to Wady Halfa. A few days after admission the tumour suddenly subsided, and it was found that a large abscess had burst into the

bowel; for a time he greatly improved, but subsequently rigor, followed by typhoid symptoms, set in, and he died on December 27th. Post-mortem examination.—Liver adherent to abdominal walls by a layer of recent lymph; a large abscess cavity was found opening into the gut on the under surface by a large ragged aperture, having a diameter equal to radius of cavity. Abscess was about the size of a child's head, and two others were discovered, one the size of an orange, the other the size of a walnut. Large intestine showed the traces of old dysenteric disease, though there was no mention of this in his medical history sheet.

There were two admissions for sunstroke, but no death. Two deaths occurred from drowning. Injuries, general.

Caused 53 admissions, chiefly for wounds (simple), sprains, and contusions. Injuries, local.

43 admissions for wounds in action occurred, with 9 deaths, viz., 7 in hospital and 2 out. Of these, 5 were wounds of the head, 4 of the face, 2 of the neck, 6 of the chest, 4 of the abdomen, 1 of the back and spine, 15 of the upper extremities, and 6 of the lower extremities. Wounded in action.

Of this number (43), 1 is reported as having been caused by gun-shot or shell, 39 by rifle bullet, &c., and 3 by splinters of stone, &c. There were no sword, lance, or spear wounds. Several men were wounded by the enemy firing into the fort at Kosheh between the 11th and 29th December, viz., 3 officers and 19 men. Of these, 1 officer and 5 men were killed, or died of their wounds subsequently; 1 man was killed on December 2nd at Ambigole Wells in an attack made by some Arabs on a small fort. At Giniss on December 30th 23 men were wounded, 1 officer and 3 men killed; 1 officer wounded.

1. The fatal cases were Private —, Royal Berks Regiment, killed at Ambigole Wells on December 2nd; gunshot wound through chest.

2. Private —, Cameron Highlanders, wounded on December 11th at Kosheh, died December 13th. Bullet passed through sternum, through chest, and out at back, causing intense inflammation of right lung; none of the larger vessels were injured.

3. Private —, Cameron Highlanders, wounded at Kosheh December 17th, died December 18th. Bullet entered at back below the crest of the ilium, and was found lying under the skin below the umbilicus, after passing through abdomen.

4. Private —, Cameron Highlanders, shot at Kosheh on December 26th through the head. He only lived 40 minutes after being wounded.

5. Private —, Cameron Highlanders, shot through head at Kosheh on December 26th. Death was instantaneous.

6. Private —, Cameron Highlanders, wounded on December 29th 1885 at Kosheh. Bullet passed in just above base of heart, and coming out at the back towards the left side, just above the eighth rib, the aorta was severed, and he lived but a few minutes.

7. Private —, Cameron Highlanders, wounded in action at Giniss on December 30th. Bullet passed in at upper part of back to right of spinal column, passed through apex of right lung, and lodged in sterno-mastoid muscle; there was pleuritic effusion into left pleural cavity. He died at Wady Halfa on January 14th 1886.

8. Private —, Durham Light Infantry, wounded in action at Giniss on December 30th 1885, died on January 2nd 1886 in the Field Hospital, Kosheh. Penetrating wound of head; left parietal bone extensively fractured; brain lacerated and protruding. He was unconscious from time of admission till he died.

9. Private —, Royal Berks Regiment, wounded in action at Giniss on December 30th, 1885, died on January 1st 1886 in the Field Hospital, Kosheh. Penetrating wound of chest and wound of lower jaw; the latter wound severed the facial artery, which was tied on the field by Surgeon C. D. Bourke. He died from the effects of the chest wound.

Self-inflicted  
wound.

I have omitted mention of one death "out of hospital" from self-inflicted wound. "Sergeant —, 1st Yorks Regiment, discharged his rifle into his mouth. The injuries caused instantaneous death. No adequate explanation of his act could be discovered. It is supposed he had received unpleasant news from home."

---

**TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, and DEATHS in the Frontier Field Force on active Service in the Soudan, from the 27th November 1885 to 22nd January 1886, together with the annual ratios per 1,000 of the strength.**

Average Strength :		Officers.				Non-commissioned officers and men.					
Officers - - - - 264		Admissions.	Deaths.	Annual ratio per 1,000.		Admissions.	Deaths.	Annual ratio per 1,000.			
Non-commissioned officers and men - - - - 5,873				Admis- sions.	Deaths.			Admis- sions.	Deaths.		
Average Annual Strength :											
Officers - - - - 41											
Non-commissioned officers and men - - - - 917											
<b>I.—GENERAL DISEASES.—GROUP A.</b>											
Sub-Group I. :											
Small-pox - - - -		—	—	—	—	—	—	—	—	—	—
Other eruptive fevers - - - -		—	—	—	—	—	—	—	—	—	—
Enteric fever - - - -		3	—	73·2	—	95	17	103·6	—	18·54	—
Other continued fevers - - - -		10	—	243·9	—	153	—	166·8	—	—	—
Yellow fever - - - -		—	—	—	—	—	—	—	—	—	—
Cholera - - - -		—	—	—	—	—	—	—	—	—	—
Dysentery - - - -		6	1	146·3	24·39	127	4	138·5	—	4·36	—
Other diseases - - - -		—	—	—	—	5	—	5·5	—	—	—
Total - - - -		19	1	463·4	24·39	380	21	414·4	—	22·90	—
<b>Sub-Group II. :</b>											
Malarial fevers - - - -		—	—	—	—	14	—	15·2	—	—	—
<b>Sub-Group III. :</b>											
Septic diseases - - - -		—	—	—	—	—	—	—	—	—	—
<b>Sub-Group IV.</b>											
Primary syphilis - - - -		—	—	—	—	41	—	44·7	—	—	—
Secondary " - - - -		—	—	—	—	21	—	22·9	—	—	—
Gonorrhœa - - - -		—	—	—	—	23	—	25·1	—	—	—
Total - - - -		—	—	—	—	85	—	92·7	—	—	—
<b>Sub-Group V. :</b>											
Hydrophobia, &c. - - - -		—	—	—	—	—	—	—	—	—	—
<b>GROUP B.</b>											
Sub-Group I. :											
Parasitic diseases - - - -		—	—	—	—	3	—	3·3	—	—	—
<b>Sub-Group II. :</b>											
Scurvy - - - -		—	—	—	—	1	—	1·1	—	—	—
Alcoholism - - - -		—	—	—	—	—	—	—	—	—	—
<b>GROUP C.</b>											
Debility, &c. - - - -		—	—	—	—	12	—	13·1	—	—	—
<b>GROUP D.</b>											
Rheumatism - - - -		—	—	—	—	21	—	22·9	—	—	—
Tubercular diseases - - - -		—	—	—	—	1	—	1·1	—	—	—
Other diseases - - - -		—	—	—	—	2	—	2·2	—	—	—

Average Strength : Officers . . . . . 264 Non-commissioned officers and men . . . . . 5,873  Average Annual Strength : Officers . . . . . 41 Non-commissioned officers and men . . . . . 917	Officers.				Non-commissioned officers and men.			
	Admissions.	Deaths.	Annual ratio per 1,000.		Admissions.	Deaths.	Annual ratio per 1,000.	
			Admis- sions.	Deaths.			Admis- sions.	Deaths.
<b>II.—LOCAL DISEASES.</b>								
Diseases of the—	—	—	—	—	11	—	12.0	—
1. Nervous system . . . . .	1	—	24.4	—	52	—	55.7	—
2. Eye . . . . .	—	—	—	—	11	—	12.0	—
3 & 4. Other organs of special senses	—	—	—	—	8	—	8.7	—
5. Circulatory system . . . . .	3	—	73.2	—	55	2	60.0	2.18
6. Respiratory " . . . . .	6	—	146.3	—	184	1	200.6	1.09
7. Digestive . . . . .	—	—	—	—	4	—	4.3	—
8. Lymphatic and glandular system	—	—	—	—	1	—	1.1	—
9. Urinary system . . . . .	—	—	—	—	10	—	10.9	—
10. Generative system . . . . .	—	—	—	—	2	—	2.2	—
11. Organs of locomotion . . . . .	—	—	—	—	33	—	36.0	—
12. Connective tissue . . . . .	—	—	—	—	64	—	69.8	—
13. Skin . . . . .	—	—	—	—	—	—	—	—
<b>III.—POISONS . . . . .</b>								
<b>IV.—INJURIES.</b>								
1. General . . . . .	—	—	—	—	2	2	2.2	2.18
2. Local . . . . .	1	—	24.4	—	53	1	57.8	1.09
3. In action . . . . .	3	2	73.2	48.78	43	9	46.9	9.82
No appreciable disease . . . . .	—	—	—	—	—	—	—	—
Cause unknown (refers to deaths only) . . . . .	—	—	—	—	—	—	—	—
<b>General total . . . . .</b>	<b>33</b>	<b>3</b>	<b>804.9</b>	<b>73.17</b>	<b>1,052</b>	<b>36</b>	<b>1147.2</b>	<b>39.26</b>

## CLASSIFIED RETURN of WOUNDS and INJURIES received in Action.

Dates of Action . . . . .	30 December 1885.	December 1885.
Places of Action . . . . .	Giniss . . . . .	Kosheh, Ambigole Wells.

Regions of the Body Wounded or Injured.	Admissions with Wounds and Injuries.								Deaths in Hospital consequent on Wounds or Injuries received in Action.								
	Killed in Action.	Total Wounded or Injured.	Projectile or Weapon by which the Wounds or Injuries were inflicted.						Total Deaths from Wounds or Injuries.	Projectile or Weapon by which the Wounds or Injuries were inflicted.							
			Gun Shot or Shell.	Rifle, Pistol, or smaller Shot.	Explosion of Gun- powder.	Sword or Sabre.	Lance, Bayonet, Spear or Knife.	Other Injuries.		Gun Shot or Shell.	Rifle, Pistol, or smaller Shot.	Explosion of Gun powder.	Knife.	Spear.	Other Injuries.		
I. Commissioned Officers :—																	
1. Wounds of the head . . .	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Wounds of the face . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Wounds of the neck . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4. Wounds of the chest . . .	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
5. Wounds of the abdomen . .	—	1	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—
6. Wounds of the back and spine.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7. Wounds of the perinæum and genital and urinary organs, not being wounds of the peritoneum.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Wounds of the upper ex- tremities.	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
9. Wounds of the lower ex- tremities.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10. Wounds with direct injury of the large arteries, not being cases of compound fracture.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11. Wounds with direct pene- tration or perforation of the large joints.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12. Wounds with direct injury of the large nerves, not being at the same time cases of compound frac- ture.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total . . .	1	3	—	3	—	—	—	—	—	1	—	1	—	—	—	—	—
II. Warrant and Non-Commis- sioned Officers and Men :—																	
1. Wounds of the head . . .	1	5	—	3	—	—	—	2	2	—	2	—	—	—	—	—	—
2. Wounds of the face . . .	—	4	—	3	—	—	—	1	—	—	—	—	—	—	—	—	—
3. Wounds of the neck . . .	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
4. Wounds of the chest . . .	1	6	—	6	—	—	—	—	4	—	4	—	—	—	—	—	—
5. Wounds of the abdomen . .	—	4	—	4	—	—	—	—	1	—	1	—	—	—	—	—	—
6. Wounds of the back and spine.	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
7. Wounds of the perinæum and genital and urinary organs, not being wounds of the peritoneum.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8. Wounds of the upper ex- tremities.	—	15	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—
9. Wounds of the lower ex- tremities.	—	6	1	5	—	—	—	—	—	—	—	—	—	—	—	—	—
10. Wounds with direct injury of the large arteries, not being cases of compound fracture.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11. Wounds with direct pene- tration or perforation of the large joints.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12. Wounds with direct injury of the large nerves, not being at the same time cases of compound frac- ture.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total . . .	2	43	1	39	—	—	—	3	7	—	7	—	—	—	—	—	—

## APPENDIX No. II.

## MEDICO - TOPOGRAPHICAL REPORT OF THE NORTH - WEST FRONTIER OF INDIA, BELUCHISTAN, AND SOUTHERN AFGHANISTAN.

By Surgeon-Major THOMAS O'FARRELL, M.A., M.D., Medical Staff.

Recent events, and the not distant possibility of military operations being necessary in the above districts, as well as having, for some time, served in those parts, have induced me to adopt them as the theme for my medico-topographical essay.

Frontier.

Before entering more particularly on the special regions embraced in this report, it may be well to remark, a rugged and lofty barrier of mountains separates Beluchistan and Afghanistan from the plains of Sind and the Punjab, and that the north-western frontier of our Indian possessions from Peshawar to Kurachi all lies west of the Indus. On the left or India side of this wide and unfordable river, with its tributaries, we have a broad gauge, single line of railway, nearly 1,000 miles long, extending from Rawal Pindi through Lahore, Mooltan, and Bhawalpur to Rohri, where it strikes the river.

Cis-Indus railways.

There is here unfortunately a break in the line and the Indus has to be crossed by steam ferry to Sukkur. From Sukkur the line follows the right bank through Ruk and Kotri to Kurachi on the seaboard.

In order to enable the Indian Government to mass any number of troops, at any given point, along this defensible line between Peshawar and Kurachi, it is now proposed to complete the bridge over the Indus at Sukkur, and make further additions to our frontier railway system.

Frontier railways.

From the main line above described several short railways run towards the frontier.

The first extends from Rawal Pindi to Peshawar, near the mouth of the Khyber Pass, the terminus being only 160 miles from Kabul. On this very important strategical line there is a bridge over the Indus at Attock both for rail and ordinary traffic.

The second joins Rawal Pindi with Khushalgarh on the Indus.

The third runs from Lala Musa below Jhelum to Bhera. This narrow gauge line, now known as the salt branch, has been converted to broad gauge and forms the first section of what will be one of our most important strategical railways.

The new line starting from Lala Musa will cross the Jhelum to Pind Dadan Khan; follow the right bank of that river until it reaches Kushab, opposite the city of Shahpur, on the high road from Lahore to Dera Ismail Khan; strike due west across the Sind-Sagar Doab, to the left bank of the Indus, some distance below its junction with the Kurrum River. Thence following the left bank of the Indus it will run south past Darya Khan, which is opposite Dera Ismail Khan. From Darya Khan it will skirt the river for nearly 100 miles, then taking a final bend to the S.E. it will join the Chenab, opposite Sher Shah, which is but a few miles from Mooltan.

A short line (25 miles) will connect the Chenab at this point with the Indus at Kurashi facing Dera Ghazi Khan. The Jhelum will be bridged, and there will be ferries over the Indus and Chenab.

This line will connect Dera Ismail Khan, Dera Ghazi Khan, and the Derajat generally, with the main railway systems of Upper India; and at Mooltan, with Kurachi and England, and will be of considerable service in all military operations in Beluchistan and Southern Afghanistan.

The fourth railway line runs north from Ruk near Sukkur, on the right bank of the Indus, through Shikarpur and Jacobabad, to Sibi, one of the districts assigned to us by the treaty of Gandamak. Though only 133 miles long, it is most important from a military and medical point of view, as it connects the roads and intended railways, leading from the Quetta, Peshin,

Sind-Peshin Railway.

and Kandahar valleys, with the main or Indus valley line; at Ruk, with Kurachi, Bombay, and England; and at Sukkur, with the large cantonments and Hill Sanitaria of Northern India.

Unfortunately it is liable to interruption during the season of the year it would be of most value, viz., during the hot weather, its lower portion being altogether dependent on the stability of a series of embankments, along the right bank of the Indus, from Kasnor to near Sukkur. A break in this bank would submerge the country for miles. The upper section is in considerable danger of being washed away by the flood-water of the mountain torrents.

Before the construction of this line the road from the Indus to the foot of the hills at Dadur in the Sibi district was through the Put or desert, and even now water for the engines has to be carried the whole distance by rail. Indifferent drinking water is procurable along this desert road, and it is utilised to some extent as an adjunct to the railway.

It is intended to further perfect our military communications by a broad gauge railway right up to and all along the left bank or Indian side of the Indus. To attain this desirable object it would be necessary to connect Attock with Khushalgarh, Khushalgarh with Kandian, on the Sind-Sagar Railway.

The line from Ruk to Karachi being on the right, or enemy's side of the river is a source of danger, and a new line should run from Rhor to Hyderabad, with a bridge at Kotri, and thence on to Karachi.

Efficient steam-ferries and boat-bridges at Kalabagh, Dera Ismail Khan, Dera Ghazi Khan, and Chachar would make the river equally important as a base of operations and as a line of defence.

Our territory between the Indus and the eastern slopes of the Suleiman Mountains is more or less of an arid, sandy waste, and with the exception of the Sind-Peshin line has no railways and but indifferent roads. The extension of the Khushalgarh line to Kohat, and a railway from Bannu to the Indus, along the southern bank of the Kurrum River, to join the Sind-Sagar line, would be of great assistance in either massing troops at Tull, for the defence of the Kurrum Pass, or for furnishing military and commissariat stores for a force operating beyond our frontier in the direction of the Shuturguridan.

It is decided to improve our communications in this region by constructing a good metalled road from the railway at Khushalgarh through Kohat and Bannu to Dera Ismail Khan, with bridges over the Kurrum and Gumbela Rivers.

In all operations beyond our frontier Dera Ismail Khan will attract considerable attention, as it is the nearest station to Ghazni, and would no doubt be used as a base, for the purpose of either barring an enemy marching through the Goumal Pass, or for feeding an offensive army, pushed along the Sarmalan plain through Katawaz to Ghazni. It is further of importance from the fact that the chief roads from Peshin through the Zhob valley join the Goumal, or Ghazni-Dera Ismail Khan road, just before it debouches on the plains, in front of Dera Ismail Khan.

The military significance of the Sind-Sagar Railway will be understood when we remember it practically links Dera Ismail Khan with Mooltan and the large garrisons of Northern Punjab.

South of the Goumal Pass the Suleiman Range is pierced by numerous defiles, all along the line facing the Dera-Ismael-Khan-Mangrota-Dera Ghazi Khan road. These passes lead into the Zhob, Bori, and Thal-Chotiali valleys, and thence on to Peshin and Kandahar. Some of these routes are perfectly practicable for troops, and have been traversed by considerable columns. The water along many of these roads is brackish, but fresh water could, no doubt, be found under the surface of the rivers. They are at present impassable for wheeled carriage, and supplies are very scanty, but a good military road is now being made from Dera Ghazi Khan, by Fort Monroe, the Rakni plain, the Chamalang and Bori valleys, and thence by Yusaf Katch to Peshin. These routes are of considerable importance, as they lead very soon to elevated plateaux, which are comparatively cool in the hot weather and could be used for marching small bodies of troops at that season, or even for large bodies, railed through Mooltan to Dera Ghazi Khan, when from any cause the Sukkur-Sibi Railway was impracticable. They afford alternative routes to Peshin and Kandahar, and a cool climates could be reached in seven days, after leaving the terminus at Kurashi opposite Dera Ghazi Khan.



The climate of the strip of country between the Indus and the hills is too well known to need description. Suffice it to say there are few places with such an oppressive hot weather, which is very much aggravated by the scarcity of water.

#### Main roads.

The chief highways, however, from Sind to Peshin, Kandahar, and Central Asia are the Bolan and Harnai routes; and would be adopted by an invader from the north-west for the main body of his army, and by the Indian Government for throwing supplies, men, and munitions of war into Quetta and Peshin, not only to resist attack on our frontier at the Kojhak, but to strike beyond it in the direction of the Kandahar—Herat, or Kandahar—Kabul lines.

The Bolan route follows the course of the Bolan River, and the Harnai, the valley of the Nari River.

There are two short railways running from Sibi for some distance along these roads. One, the continuation of the main line, goes north to Kilat-i-Kila on the Harnai route, and the other due west across the well-watered plains of Gundava-Kutch to Pir Chowky at the mouth of the Bolan.

#### Climate.

The climate of Pir Chowky and Kilat-i-Kila, and indeed on either road until Mach or Harnai is reached, is tolerable in winter, but the heat is terrific in summer. The writer had charge of No. 3 Field Hospital at Pir Chowky for some months during the last Afghan war, and though he left it as early as the end of May, has vivid recollections of the intense heat.

Cholera, sunstroke, scurvy, small-pox, liver disease, dysentery, and fatal fevers are common, and during last summer the railway works between Pir Chowky and Mach had to be suspended in consequence of the extreme unhealthiness of the Pass; over 50 per cent. of the railway staff were at one time on the sick list from fever, dysentery, and sunstroke, and the coolies left in a body, scared by a fatal epidemic of cholera.

#### Bolan route.

We will first follow the Bolan route, as it is the best and shortest. During the last war, Pir Chowky, at the entrance of the Pass, as the rail head was the depôt from which troops and material were dispatched to the front, and all sick convoys coming down the Pass, after having halted at No. 3 Field Hospital, were railed to the Indus for subsequent dispatch either to Kurachi or Lahore. It was also the starting point for transport trains and hired carriage.

The presence of such a large number of men and animals made the water liable to pollution, and later on the depôt was retired to Rindili, which is some three miles nearer to Sibi. At Rindili the water was plentiful and good, and mud sheds were built for the convenience and protection of the troops returning to India on the evacuation of Kandahar. The arrangements were then so complete that not a man of the returning army died there from sunstroke, although the heat was intense. The importance of both Rindili and Pir Chowky has dwindled into insignificance since the line has been pushed on to the central Bolan station of Mach. The latter becoming the rail-head and depôt, the former, way side stations.

#### Mach.

When we remember there is nothing produced in the Peshin or Quetta districts but what is required for the support of the inhabitants, and that food for a force, for the army of followers, and food even for the transport animals themselves must be sent from India, the advantage derived from this railway extension to Mach will be apparent. Transport trains will start from here, and men and baggage animals will be spared the rugged and tortuous defiles of the lower Bolan. As Mach is 3,000 feet higher than Rindili, troops de-training there will at once enjoy a comparatively cool climate, and will not have to undergo the long and dusty 42 miles between Pir Chowky and Mach.

#### Bolan Railway.

This new line is laid in the bed of the Bolan River, and winds up the Pass by steep gradients and sinuous curves, reaching an elevation of 1,100 feet at the Baluch village of North Kirta, 2,500 feet at New Ab-i-gum, and 3,500 feet at Mach.

The rail follows the road between precipitous cliffs and over stony plains, crossing and recrossing the river, and not more than a few feet above its normal level.

It is hoped the Bolan floods, which are very sudden and violent, will pass as harmlessly over the rails as traffic over an ordinary level crossing. But as these freshets sometimes reach a height of 10 feet this anticipation requires

the trial of experience, and as the military road may have to be at times resorted to it, may be well to give a short description of it.

The road from Pir Chowky to Kohandilani, after crossing the river frequently between high conglomerate hills, enters the Kohandilani gorge, about 300 yards wide, distance eight miles. From Kohandilani to South Kirta is eight miles, and four more on to North Kirta. The road at first enters a narrow gorge, frequently crosses the river, and is especially liable to flooding from South to North Kirta, it ascends a long low hill which separates it from the river. At North Kirta there is a walled enclosure, bungalows, a hospital for natives, commissariat transport and railway depôt. Water is obtained from the stream and a well in the vicinity, it is plentiful and good. Of the Bolan water generally it may be said to be excellent, though somewhat hard. The usual precautions of taking the drinking water higher up than the portion reserved for ablution and watering of animals must be strictly attended to, as well as the removal and burying or burning of any transport animals that may have died in the vicinity of the stream. From North Kirta the road ascends to New Bibi Nani, nine miles, and thence on to New Ab-i-gum, seven miles. The water on these stages is uncertain and liable to be interfered with.

Bolan road.

Water.

From New Ab-i-gum to Mach the distance is about six miles, thus making it six marches to Mach from Pir Chowky, and somewhat more than 42 miles.

The present camping ground at Mach is very cramped and occupies the high bank on the west side of the river; the water is a considerable distance off, and has to be carried up a high ramp. During the last war there was a large depôt of commissariat and transport stores at Mach, and a rest depôt with a medical officer was established there. There was also a telegraph and post office at some distance higher up the Pass. As being the rail-head now it will become a much more important place, and a large hospital will have to be provided there for the sick of parties, either going up or down the Pass. At some villages near, eggs, milk, and fowls are procurable. There are some low hills on the opposite side of the river, presenting indications of coal, and fossils abound, geological specimens of the Bolan formation were presented by the writer to the Netley Museum.

Mach.

From Mach to Quetta, for the present, troops will have to march, and transport which has hitherto been the great difficulty hampering our movements beyond the Indus will have to be resorted to. It is, however, contemplated to join Mach with Quetta by rail, and the works have already been started. From Darwaza to Quetta will present no difficulties, but the steep incline beyond Mach will be the crux of the undertaking. This latter section it is intended should be narrow gauge, and will be worked by powerful Fairley engines. Rolling stock, rails, and materials intended for the extension of the line to the foot of the Kojhak will be placed on trucks, and thus drawn up the steep gradients and sharp curves between Mach and Darwaza.

Bolan Railway.

But as at present the distance between Quetta and Mach has to be marched a short description of the route is necessary.

Upper Bolan road.

From Mach the road ascends 1,000 feet to Sir-i-Bolan, distance over four miles. Sir-i-Bolan is the source of the Bolan River, the water comes sweet and wholesome as a spring from the foot of the mountains.

From Sir-i-Bolan to Lower Dozan is  $4\frac{1}{2}$  miles, a narrow defile, known as the Zigzags, is traversed on this march. At Lower Dozan there is a large commissariat and transport depôt, bungalows, &c.

The water is a long distance off, and comes by an aqueduct from the Dozan spring; the water is excellent, but much inconvenience is caused by its being on the opposite side of the river.

From Lower Dozan to Darwaza is  $7\frac{1}{2}$  miles. The Kharlaki Kotal or termination of the Bolan Pass is crossed on this march; it is about 6,000 feet high and 56 miles from the entrance of the Pass. From the Kotal the road descends to the plain of the Chota Dasht.

At Darwaza there is a fort and bungalows; indifferent water is obtained from deep wells. In winter time, at all events, Darwaza should be avoided as a halting place, not only on account of the intense cold but for the scantiness of the water. It is 5,800 feet high, and on no account should sick convoys, especially native ones, be halted there for a night in the cold weather.

Darwaza to be avoided.

The 25 miles between Dozan and Sir-i-ab should be done in one march. When the railway is completed it is intended to pump water from the Dozan springs up to Darwaza, and thence by pipes onwards towards Quetta.

From Darwaza to Sir-i-ab, a distance of  $17\frac{1}{2}$  miles, is totally without water, and the road is, for a good part of its course, through the Big Dasht.

Karez.

At Sir-i-ab the first karez is seen—a karez is an underground aqueduct, leading from the hills, a likely place at the foot of the hills is chosen, and a shallow well is sunk; following the natural slope of the country another well is dug in a line, and at a short distance from the first the space between the two wells is then tunnelled by men working from each well; by a series of such wells and tunnels water is brought from the hills to the villages of the plain; these karezes are sometimes two or three miles long.

The distance between Sir-i-ab and Quetta is only six miles; the road is good, and runs through the Shál Valley.

Brahoos.

The inhabitants of the Bolan are Brahoos, Mohamedans of the Sunite sect; they are a brave and warlike race, and few of the chief men are without scars of old tulwar wounds; most of the scars which came under writer's notice where not on the head, were in the vicinity of the hip and shoulder joints, possibly dealt with the intention of opening a joint and disabling a limb. The Brahoos are nomads, and migrate to the plains of Gundava Katch in the winter, where they feed their flocks and sow barley, or as it is more generally known, "Kusseel."

These people are very well disposed towards us, but it must be admitted the Bolan road is well "metalled."

Shál Valley.

The Shál or Quetta Valley is traversed by the Bolan road, and communicates on the south with the Dasht-i-be-daolat, and on the north and west with the Peshin district. It is about 20 miles long, and five to seven broad, and is shut in on nearly all sides by high mountains; but to the north-west is a low range of hills across the mouth of the valley, separating it from Peshin. This ridge, with its passes, extends from the northern end of the Chilhaltan range to an offshoot from the Takatu Mountain, and is about four miles long.

The Chilhaltan range bounds the Shál Valley on the west, and separates it from the Kanak Valley, the latter in its turn is separated from the Sharod Valley by the Kanak range. The Zarghun Mountains bound the eastern side of the Shál Valley, and separate it from the Harnai Valley.

River.

The Shál Lora is the principal river, and after draining the valley passes northwards through a gap in the low range of hills above mentioned to join the Kakar Lora at Haidarzai in Peshin.

Roads.

The main road from Quetta to Peshin, and Kandahar, traverses the whole length of the Shál Valley, crosses the Shál Lora, and leaves the valley through the Gazarband Pass. Roads communicating with the Kanak and Sharod Valleys, Mastung and Kelat branch off from this at Samanguli, a large village seven miles from Quetta.

The old road through the Kakar Lora Valley *viâ* Kuchlak to Kach—the old Kandahar road *viâ* Haidarzai and Haikalzai to the Kojhak—as well as the Kushdil Khan-Ghazni route, leave the valley as one road, through the Margha Pass, a narrow gorge, to the west, but near the foot of the Takatu Mountain. Kuchlak is 12 miles from Quetta and 19 from Gharkai.

To the east of the Takatu Mountains a road leading to Kach on the Harnai road, in two marches, quits the Shál Valley at the Sharkalla Pass. This road is of great strategical importance, as it would allow of a flank attack from Quetta on an army endeavouring to force a passage down the Harnai route.

Nigandi.

On the east the Han Pass leads to the Han Valley, at the head of which is the new Sanitarium of Nigandi, which, though only 15 miles from Quetta, is 1,000 feet higher, and immensely more healthy. The principal water supply of Quetta comes through the Han Pass.

On the left the Nishpa Pass leads to Mastang.

The Shál Valley is well watered and fertile; there are numerous walled villages, enclosing considerable orchards, and a large population.

Quetta.

Shálkot or Quetta, lat.  $30^{\circ} 12'$  and  $66^{\circ} 55' E.$  long., and 5,514 feet above the sea, is at the northern end of the Shál Valley, and consists of the fort, military cantonment, civil lines, and the new bazar or native town.

Fort.

Originally, as in other trans-Indus towns, all the inhabitants lived either inside the fort or under the shadow of its walls, but in 1879 the houses within

the fort were pulled down to make way for artillery barracks, and those outside levelled to form the glacis.

The fort covers about a quarter of a square mile; it is surrounded by a high mud wall and a deep wide ditch. There is a citadel in the centre on which guns are mounted. The siege train is composed of 40-pounder and 25-pounder rifled muzzle-loading guns, and 6·3" rifled muzzle-loading howitzers.

There are artillery and infantry barracks, inside the fort, capable of accommodating some 70 or 80 men. All the drinking water is obtained from the outside; there are, however, two wells inside which could be used if the water was filtered. The made ground inside the fort is some 14 feet thick, and contains human bones.

The cantonment, which extends for about a mile to the N.E. of the fort, consists of the old and new barracks, hospital, &c. The old barracks, now occupied by native infantry, are mud huts with flat roofs and mud floors, and admit the rain freely; they are badly ventilated, and very unhealthy. The native cavalry barracks have domed roofs, and are consequently somewhat better than the infantry ones. Cantonment.  
Barracks.

The new barracks are capable of accommodating an European infantry regiment, and consist of eight one-storied isolated blocks placed *en echelon*; they are built of sun-dried bricks, have zinc roofs, and are fairly comfortable.

The hospital buildings were originally built for stables. The roofs and floors are of mud; they are low, dark, and dusty, and very unhealthy; they are capable of accommodating some 180 patients. During the last Afghan war they were full of enteric fever cases, and still maintain their old reputation. Hospital.

A new hospital is, however, in the course of construction on some elevated ground, about a quarter of a mile from the new barracks.

The Quetta bazar is situated south of the cantonment, it contains a fruit market and many shops; everything can be got there, but the prices at present are exorbitant. Peaches, pears, and apples are to be had in abundance. Bazar.

Notwithstanding its elevation the climate of the Shál Valley is bad; sun-stroke, enteric fever, pernicious ague, cholera, diarrhoea, dysentery, abscess of the liver, epidemic pneumonia, tonsillitis, bronchitis, and jaundice are very common, and the death-rate is very high. Two causes contribute to make the Quetta Valley unhealthy—bad water, and extreme variations of temperature; to these are added in cantonments ill-ventilated and leaky dwellings. Diseases.

The water of the Quetta Valley comes from springs in the mountains, either by karezes or open streams, it contains large quantities of the salts of lime and magnesia, as well as marked quantities of organic impurities. The graveyards in many places are dug in the beds of streams, and the water is always "suspicious" and generally "bad." Nearly everyone complains of diarrhoea, and the number suffering from jaundice is remarkable. This jaundice, supposed to be due to catarrh of the bile ducts, is ushered in by vomiting, and loss of appetite, which persists for days, and these symptoms only abate when the yellow discolouration appears. Water.  
Jaundice.

As to the extreme variations of temperature, it may be stated, the summer heat varies from 80° to 100° Fahr. In winter the snow lies deep on the mountains and in the valley, and the mercury falls below the freezing point; besides there is a difference of 40° Fahr. between the temperature of the day and that of the night. Meteorology.

The rainy months are March, April, July, and August. The atmosphere is loaded with moisture during the spring rains, and in the autumn, which is the most unhealthy season, cold bitter winds blow from the north, while the solar rays are still very powerful. The average highest temperature in July is 95°, while the average lowest temperature in December is 28°. Moreover, during the summer the air is loaded with dust to such an extent that at times the sun is obscured. There are, as in England, four seasons, but here they are very rigorous.

The writer was for some time Sanitary Officer of Quetta, and can bear testimony to the unsanitary construction of the buildings, bad water, and trying character of the climate.

The important strategical position of Quetta, commanding as it does the lines of communication by road and railway, necessitates the proximate

Sanitaria.

presence of a large garrison, and the injurious effects of the climate are in a measure mitigated for Europeans by the establishment in its neighbourhood of Hill Sanitaria. At present there are two, the one before alluded to on the Zerghun is only 15 miles from Quetta, while the other, Gwashki, is 63 miles distant. Gwashki is only 29 miles from Kach in Harnai, and when the railway is complete Kach will be the station for this sanitarium. Most favourable accounts of the health of men sent to these sanitaria are published, and when houses and hut barracks are built they are likely to be favourite resorts during the summer and autumn, and will permit the European garrison to be frequently changed to the hills.

Lime juice.

Three batteries of artillery and four companies of infantry were this year accommodated at Gwashki, and two companies of infantry and a battery at Nigandi. It has been suggested that native soldiers at Quetta should be allowed a meat ration, and there can be no doubt of the necessity of giving lime juice occasionally throughout these regions.

Harnai route.

We will now follow the Harnai route.

The Harnai route was originally chosen for the construction of the Sind-Peshin Railway, and though longer than the Bolan route it was expected the engineering difficulties would have been less, but the bridging, tunnelling and cutting on the line has been found fearfully heavy, and the frequent floods have much retarded the work, so that in all probability the line up the Bolan will be completed first.

At present the rail-head is at Kilat-i-Kila, and from there a good cart road ascends the valley of the Nari River, goes over the Bahdra plain, and through the Kuchali defiles. It traverses the long Harnai Valley, passes through the Chappar Rift to Kach, and on through the gorge to Gharkai in Peshin. At Gharkai it turns to the south-west down the Kakar Lora Valley, passes Bostan and Kuchlak, and going over the Marghi Pass enters the Shál Valley and on to Quetta.

The distance from Kilat-i-Kila to Gharkai is about 110 miles.

The first part of the road from Kilat-i-Kila to Spintangi is through the Mari country; the inhabitants are ill-disposed and gave a lot of trouble after the investment of Kandahar.

Harnai.

At Harnai the people are friendly, and supplies are procurable. Harnai is 2,600 feet above the sea, and the climate is tolerable throughout the year. A new road is now being built from Harnai to Singawi in Bori.

Sharq.

At Sharq, two marches beyond Harnai, it is proposed to build a strong post; water is plentiful and good, the valley is fertile, supplies are obtainable, and being 3,800 feet above the sea is a fairly cool climate, and in this respect resembles Mach in the Bolan. Sharq would be a good position for a large rest depôt or small general hospital.

Chappar.

At an elevation of about 500 feet, and between Dargi and Mangi, we have the Chappar Rift, it is about  $1\frac{1}{2}$  miles long and is of elliptical shape, the ends or mouths being only a few yards broad.

The cliffs at the entrance are about 300 feet and rise to 1,000 feet in the centre. The rift is very subject to floods, sometimes rising to 30 feet.

Kach Post is a strong defensive enclosure, containing quarters for a native infantry regiment; there is a good encamping ground, and water is abundant. Kach is connected with Quetta by a very important cart road, through the pass of Sharkhula. The elevation of Kach is 6,300 feet.

Climate.

The climate of the Harnai route resembles that of the Bolan, the heat in summer is intense and even in houses at an altitude of 4,000 feet the thermometer in August last registered 98° Fahr.; and fever, sunstroke, and cholera put a stop to the railway works recently.

Twin railways.

The Harnai route, as offering an alternative road to Peshin, is of great value, and when the twin railways are finished our communications with the Peshin plateau will be comparatively complete.

Yagistan.

Allusion has previously been made to the routes leading from the Indus to Peshin and Kandahar over the Suleiman Mountains, and this portion of our frontier has of late attracted considerable attention, as it has been suggested an enemy from the north-west could take a straight road from Kandahar to Mooltan, either feigning to attack Quetta, or avoiding it altogether. It is claimed for this route that it runs over an elevated table-land, everywhere

habitable, for Europeans, fertile, well watered, rich in forage, sparsely populated, and belonging to neither Kelat nor Kabul. The climate is the climate of Simla, and it commands the Bolan, and blocks the whole series of passes into the Derajat, and finally that its owner will command the gates of India.

On the other hand, it is stated this Sewistan or Yagistan, or independent territory for the most part, consists of an inhospitable wilderness, that the water is saline, and the climate, except in the higher valleys, detestable. That the routes through the country are so numerous it may be said to be open. With the exception of the Maris, it is admitted the people are inoffensive and peaceable, and it is conceded also good grass is obtainable on the plateaux; but that here the supplies end.

As all the country east of the Khwaja Amran range was ceded to us by the treaty of Gandamak, Yagistan already belongs to us, and to improve our communications a road is being constructed from Dera Ghazi Khan to Peshin. It will run north of the Harnai Railway, so as to provide covering movements of troops, to guard the line from tribal attacks, and with this view a branch road will run north from Harnai to the Bori Valley. Peshin-Punjab road.

The main road will go to Fort Monro, at the foot of the Suleiman Mountains, and crossing the range will traverse the Rakni plain to Anambar, and thence through the undulating plains of Bori Valley to Chingan.

From Chingan the road will mount the Chari Momand (8,285 feet), which is the water parting between Bori and Peshin, and thence passing through grand scenery lead to Yusuf Kach and Balozai in Peshin.

The route, at either end, is very hilly, but the country is well under control; on the other hand, the Bori Valley—38 miles long and 5 to 15 broad—is open; but opposition may be expected from the tribes.

From the main track numerous roads pass over the mountains into Jhob on the north, and into Thal-Chotiali on the south; of the former may be mentioned a gap through the hills called the Tokazai Kotal, which leads into Jhob and through the Vihowa pass into the Punjab; and another from Chingan to Hindu Bagh in Jhob, and of the latter a road passes south-east from Chingan to Biani, Sinjawi, to Duki, and thence to Thal and Chotiali.

The general elevation of the route is over 5,000 feet, and it would be a great advantage if we could abandon some of our unhealthy stations on the right bank of the Indus for strategical positions on these highlands.

From Mithankot on the Indus confronting the railway terminus at Chachar (where the Punjab rivers become one), we have a very important road traversing Sewistan. It passes through Harand, over the Sham plain to Quat Mandai and Harnai, and communicates with the Thal-Chotiali road. Mithankot road.

The Thal-Chotiali road goes north of this through Vitakai to Chotiali, Thal, and Duki, and thence on to Chingan, on the Punjab-Peshin road. It is intended to build a strong post at Thal. Thal-Chotiali road.

The Punjab is also connected with Peshin and with Ghazni and Kandahar by means of the Jhob Valley. This valley lower than the Bori Valley stretches eastward from the Toba highland, and is about 100 miles long and 20 broad. It communicates on the north-east with the Goumal route, on the east by the Darband and Vihowa passes with Dera Ishmail Khan, south with Chingan and Bori, on the south-west with Balozai, in the Peshin district, and on the north-west by Gurdan and Maruf, whence there are roads to Kandahar and Ghazni. Jhob or Jhob Valley.

In the centre of Jhob there is a tract of tamarisk jungal, some 20 miles long, which affords forage for large herds. The climate of Jhob is intermediate between that of the Punjab and Peshin, and resembles that of Harnai. The rainfall is greater than that of Peshin, and it is more fertile. The valley slopes gently to the east, the average elevation being about 3,500 feet. The inhabitants are contumacious and predatory.

To return to the Bolan-Kandahar road, we find the Gazarband ridge with a branch of the Brahnic hills, separates Shal from Peshin, or in other words, Beluchistan from Afghanistan; and Peshin itself is separated in its turn from the valleys of Kadanai and Kandahar by the Khwaja Amran range, which is an offshoot from the Toba plateaux. Peshin.

Peshin consists of two portions, a mountainous district and the plain of Peshin proper; the latter is only about a quarter of the whole. The average

elevation of the Peshin Valley is about 5,000 feet, and it is about three times as large and 500 feet lower than the Shál Valley. The general elevation of the Khwaja Amran range, which bounds it on the north-west, is about 7,500 feet, and that of its highest peak is said to be over 8,800 feet.

Of the hills separating Peshin from Shál, the Takatu rises to 11,000 feet.

Peshin Valley.

The valley may be described as a parallelogram between the two ranges above alluded to, and closed in on the north by the Toba plateau, while it is separated from Shorawak on the south by an extensive tract of low hills.

Peshin Lora River.

Its river system begins in the north, where the Barshor Nala and Tor Margha stream join some two miles north of Khushdil Khan to form the Peshin Lora. This Peshin Lora, joined by the Dori nulla and Surkab River, finally unites with the Kakar Lora at Shadizai forming the Lora River, which is eventually lost in the sandy region south-west of Shorawak.

Kakar Lora River.

The Kakar Lora River is formed by two tributaries, one coming through the Gharkai Gorge, and another down the Gwal Valley, uniting some distance below Manzakai. The Kakar Lora passes out of its valley, through the low red hills which separate it, from Haidarzai; here the river has a deep bed with perpendicular banks 20 feet high.

At Haidarzai the Kakar Lora is joined by the Shal Lora, and the united streams continue north-westward to Shadizai, where they empty themselves into the Lora proper or Peshin Lora.

Irrigation schemes.

The general slope of the valley is towards the Lora River. Peshin is very badly cultivated, but this is mainly due to the absence of irrigation, and it is now intended to supply this want by either having an inundation channel from the Kakar Lora, below Haidarzai, to the plain at Shebo, or to divert the flood water of the Barshor stream, above Khush-dil-Khan, and to store it in a reservoir below New Bazar.

In addition to the river system above described there are numerous karezes and streams which run down from the mountains on all sides.

Climate.

The climate of Peshin is very relaxing, and somewhat similar to that of Shál, but it is warmer in summer and colder in winter. March and April are the cool months, but a strong wind from the south-west raises an enormous amount of dust, the whole air is pervaded with it, and this sometimes occurs even at night. The dust very frequently takes the form of columns.

In May, June, and July in addition to the dust the wind is hot and oppressive, and there is a regular plague of flies.

When the writer was at Killa Abdulla in August 1880 the dust filled the air from about 9 a.m. to 5 p.m. No fires could be lighted without some protection against the wind, and the usual practice was to cook all the food in the morning, and heat it up again when wanted for dinner in the evening. In September and October the flies diminish in number, the dust only gives annoyance for a few hours in the day, and there is a sensible coolness in the weather. The winter is cold, bleak, and gloomy, the leaves fall from the trees, and even the grass disappears. On the whole, the climate is trying to both Europeans and Indians.

Peshin is barren.

The inhabitants are friendly enough, but supplies and firewood are scarce. The chief crops are wheat, barley, rice, Indian corn, and lucerne. Apricots, plums, peaches, grapes, apples, figs, pomegranates, and walnuts are cultivated.

Strategical value of Peshin.

The chief value of Peshin is that here all the roads leading from Kelat, Shorawak, and the Indus meet those coming from Kandahar, Ghazni, and South-western Afghanistan, and that it makes an excellent *place d'armes* for an advance on Kandahar, and dominates the most of Southern Afghanistan.

There are not, as yet, many good roads through the valley, and we will now notice a few of the principal ones.

Kandahar Road.

The main road up the Bolan is prolonged beyond Quetta over the Khojak Pass to Chaman, and thence to Kandahar. The first march to Mehtarzai from Quetta is nine miles, in this stage the Shál Lora is crossed.

From Mehtarzai to Dinar Karez is 12 miles. The Salt Lora is crossed and the Ghazarband defile is mounted and quitted; the water at Dinar Karez is brackish.

From Dinar Karez to Segi, distance nine miles. Just near Segi the Lora River is crossed, the banks are very high, and it is about 300 yards across. The

water in the river is saline, and at some distance from the camp. There is a direct road from Segi to Killa Abdula of about 15 miles.

From Segi to Gulistan Karez is 10 miles. There is a pretty large fort at Gulistan, and its position at the foot of the hills is an important one, as it guards the entrance to the Gwajha Pass to the south-west, and the Roghani Pass on the north-west. The water at Gulistan is good and abundant, there are some trees and vegetation about, and it is altogether the prettiest place in the valley.

From Gulistan the road leads along the outer spurs of the hills to the east of the range, and joining with the direct road from Segi, passes into the small plain of Abdula Khan Kila. There is a large fort at Abdula Khan Kila, with commissariat and transport depôts. The water comes from an irrigation channel, and is liable both to contamination and interruption. There is a village near the fort from which some supplies are procurable.

Abdula Kila or  
Killa Abdulla.

In consequence of its being at the foot of the Kojhak, the ground when writer was there was saturated and the air impregnated with the decomposing bodies of transport animals. In fact, his chief work as sanitary officer was to personally see if his directions as to removing the carcases were carried out. At first, large fatigue parties dug huge graves, and it was a strange sight to watch three or four camels drawing a dead comrade by his hind legs to his last resting place; it was found, however, the sandy nature of the soil had not sufficient deodorising properties, and the carcases were subsequently burned. A little straw or brushwood soaked in kerosine oil does the business; the entrails should, however, be first removed and buried.

From Abdula Khan Kila to Chaman the Kojhak Pass is crossed at 10 miles, and the distance between the two forts is 15 miles.

The Khwaja Amran range is about 50 miles long, and extends from Toba to Shorawak, and is pierced by numerous passes, viz. (from north to south), the Kojhak, the Sauzal, the Roghani, the Zargani, and the Gwajha. The Sauzal is practicable for cavalry, but the Azanga or Zargani, as it is sometimes called, is a mere track. The Kojhak and Gwajha are both practicable for artillery, but the Roghani is not.

Khwaja Amran.

Passes.

The Khwaja Amran range, like most of the mountains in this region, has at its base on each side a *daman* or skirt. It is formed of the debris of the mountains, and is a table-land sloping gently towards the plains, and extends on the Kandahar side 8 or 10 miles. It has been likened to the glacia of a fortress, but it is usually much cut up by mountain torrents. The *daman* on the Killa Abdulla side affords ample space for the encampment of 10,000 men.

The road over the Kojhak is a narrow zigzag, exceedingly precipitate, but fortunately very short. The road in 1880 was fairly good for artillery, but it must have fallen out of repair, as it recently took the siege train on its way to Herat 10 days to cross it after much labour and difficulty. The elevation of the Pass is 7,200 feet.

The Kojhak.

The Fort of Chaman is on a low spur to the right of the road, whereas the camping ground is on the left. Water is obtained from springs near the fort. In fact, springs are pretty abundant all along the western slopes of the range.

Chaman.

In all probability an entrenched camp will be formed at Chaman, and a strong force left in occupation, as the defence of the whole range depends to a great extent on its possession.

There is a road (28 miles) along the Daman on the western side, which joins Chaman with the opening of the Gwajha Pass on the Kandahar side. It covers the line of springs above alluded to.

Chaman, our advanced post in this direction, is 80 miles from Kandahar and 451 from Herat. The marches from Chaman to Kandahar are—1st, Gatai, 17 miles; 2nd, Dabrai, 9 miles; 3rd, Mel Karez, 12 miles; 4th, Abdul Rahman, 14 miles; 5th, Mand-i-Hissar, 15 miles; and 6th, Kandahar, 12 miles.

Chaman-Kandahar road.

There is no water between Chaman and Gatai, and no supplies are procurable until Mand-i-Hissar is reached. There are ample means of feeding a large force around Kandahar, and it has been suggested that in the event of complications beyond our frontier in this direction it might be necessary, in

Kandahar Valley fertile.



consequence of the barrenness of Peshin, to push on one or two divisions to the vicinity of Kandahar for commissariat purposes alone.

Roads to Kandahar.

There are two other roads from Chaman to Kandahar, one called the Barghana road, divided into seven marches, is some two miles shorter than the high road, and is used as an alternative route. The other over the Kussa Pass is 86 miles.

Gwajha Pass.

The road from Gulistan Karez to Kandahar, over the Gwajha Pass, is 114 miles, divided into nine marches.

The Gwajha Pass is much easier than the Kojhak, and was used for the 40 pounder Armstrong's and General Stewart's Division in the winter of 1879. The great drawback to this route is the scarcity of water between the foot of the hills and Shah Pasand.

Roads.

The old road from Quetta to Killa Abdulla is about 52 miles, or just a little longer than the road over the Gazerband Pass. It is thus divided: Kuchlak, 11½; Sayad Yarn Karez, 11½; Harkalzai, 9½; Asad Khan Camp, 10; Abdulla Khan Kila, 9½. It is a good road, and practicable for wheeled artillery.

Road to Ghazni.

The road to Ghazni from Quetta leaves the above at Sayad Yarn Karez, goes through New Bazar and Kushdil Khan, the total distance to Ghazni being 292 miles.

Harnai-Kojhak road.

The road from Kilat-i-Killa up through Harnai, as before stated, goes through the Gharkai defile, here it sends a branch down the Kakar Lora Valley via Kuchlak to Quetta, and the main road goes across the valley to the Ishpezena Pass, crossing the Kakar Lora River, and then down the narrow valley of the Surkhah to Bagh China, 10½ miles. From Bagh China the road goes by New Bazar, and thence to Harkalzai, distance 12 miles. From Harkalzai to Asad Khan is 10 miles, the Dori Nala and Peshin Lora are crossed in this march. From Asad Khan to Killa Abdulla is 9½ miles.

This is a good road in dry weather, but as the soil is clay it is unsuitable for wheeled carriage during the wet season, it is then usual to go round by Kushdil Khan, Alizai, and Badwan.

Distances in Peshin.

Among other distances in Peshin Valley may be mentioned, Quetta to Bostan, 20 miles; Bostan to Peshin, 18 miles; Peshin to Syud Hamid, 15 miles; Syud Hamid to Killa Abdulla, 12 miles; Killa Abdulla to Peshin, 26 miles; Bostan to Shibo, 10 miles; Peshin to Kanai, 12 miles.

Bostan.

Bostan is on the Kasim Kala-Gwal road, and is two miles from Kasim Kala and half a mile from the Kakar Lora River. It is of some importance strategically, as it covers the proposed railway, and is the best defensible position in the Kakar Lora Valley.

Peshin.

Peshin.—In 1881 a large fort and cantonment were built at Peshin, which is in the south-east of the valley. It can accommodate a full native regiment and a squadron of cavalry. There is abundance of water, but it is much impregnated with saline matter and organic impurities. Peshin is strategically of value, as it commands the road from Harnai to the Kojhak.

The cantonment has been tastefully laid out, and there are large commissariat and transport depôts formed there.

Syud Hamid.

Syud Hamid, on the Lora is midway between Gulistan and Peshin Fort, and more than half-way between Peshin and the Kojhak. It is of importance, as being the locality chosen for the site of the new entrenched camp, which will be a large fortified work, covering the railway. It is not quite settled whether a considerable force will permanently occupy it or not. It is considered the best plan would be to keep a small permanent force there, while the greater part of its intended garrison are accommodated on some of the neighbouring mountains, during the unhealthy season at all events. There are several positions on the Toba plateau, overlooking the Kandahar province, which could be utilised for this purpose.

Khushdil Khan.

Khushdil Khan Kila is a tolerably large fort, situated at the northern end of the valley, and its value consists in its position on the Quetta-Ghazni road and the protection it affords against incursions from Jhob and Toba.

Sind-Peshin Railway.

The Sind-Peshin Railway will follow the Harnai road, through the Chapar Rift and Gharkai defile, into Peshin. It will then turn down the Kakar Lora Valley to Kasim Kala, whence the branch line is to go to Quetta; the main line to follow the Kakar Lora, north-westwards to Hardarzi, and thence by the Kakar Lora Gap into the plain of Peshin Proper. Turning westward at

Shebo the Lora will be crossed at Syud Hamid, the line to lead straight on to Gulistan and thence to Killa Abdulla.

The course, however, which the railway will take beyond Shebo towards Kandahar has not been definitely settled, but the following three schemes have met with support:—

I. As originally intended, by Gulistan and the Gwajha Pass, with a branch to Killa Abdulla. Railway schemes.

II. From Shebo straight on to the Kojhak, with a bridge over the Lora, a tunnel through the Kojhak, and a strong post at the terminus at Chaman. Shebo.  
Shebo is strategically well placed between the Lora and one of its tributaries, and the country is quite open between the Lora and the Khwaja Amran.

III. It has even been proposed to avoid the Khwaja Amran range altogether, and go round by Nushki to Kandahar, or even to push on the rails to Seistan, so as to strengthen our left flank, which would naturally rest on the Lower Helmund, near Lash-Jawain. Our left flank.

Notwithstanding its length this latter line could be constructed with ease, and it could be used to oppose any attempt on the part of an enemy in possession of Herat trying to turn our left flank by a march across the desert from the Helmund *via* Shora-rûd and Kelat.

There are two great strategical triangles in Afghanistan, one known as General Hamley's and the other as Lord Lytton's. The former has for its angles Herat, Balk, and Kandahar; the latter Ghazni, Kabul, and Jellalabad, and with a view to the occupation of one or both of these it has been proposed to collect in Peshin a large quantity of railway material and to have the earth-work finished and bridges made, not only between Chaman and Kandahar, but between Kandahar and Kabul *via* Ghazni, so that in case of emergency the rails could be readily put down, and by the occupation of Kandahar with outposts on the Helmund we could assist our ally the Ameer in repelling invasion from the direction of Herat, and similarly by the occupation of Kabul, Ghazni, and Jellalabad we could help him to defend his kingdom from an enemy in possession of the passes of the Paropomissus. Great strategical triangles.

## APPENDIX No. III.

A SKETCH OF THE MEDICAL ARRANGEMENTS SUITABLE FOR  
AN ARMY CORPS OPERATING IN BELUCHISTAN AND  
SOUTHERN AFGHANISTAN.

---

By Surgeon-Major T. O'FARRELL, M.A., M.D., Medical Staff.

---

**Army corps.**

The proportion of the different arms and the ratio of British to Native troops in an Indian army corps depends in actual warfare on the nature of the country, the service to be performed, and the enemy the force is likely to be pitted against.

It can therefore be readily understood that in all operations in the above countries, the composition of an army corps would much depend on whether it was mobilised with an offensive or defensive object, and as to whether its opponent was an Oriental one like the Ameer of Afghanistan or a great military power such as Russia.

In the former case, the usual proportion of two Natives to one British soldier would be amply sufficient, whereas in the latter the force would require to be well supplied with artillery and strong in the European element, and whatever enemy it was opposed to it should be powerful in cavalry, as thus only could the movements of a foe advancing from Kandahar across the Kadanai Plain be watched from the numerous peaks of the Khwaja Amran range.

**Medical arrangements subject to variation.**

That the medical arrangements would also be modified by like considerations is very apparent, for the long range ordnance and the modern perfected rifles of the Russians would very largely increase the number of men likely to be seriously wounded, thus necessitating a corresponding augmentation in the hospital provision, and the present arrangement by which the Indian field hospitals, with their bearer columns or companies, are advanced and established in the immediate vicinity of the scene of action would have to be discontinued, and bearer companies should be maintained as a separate and distinct organisation from field hospitals.

**Normal Indian army corps.**

The rapidity of advance and the celerity of the movements of such an opponent, the great magnitude of the actions likely to be fought, and the way victory on either side would be pushed home, all have important bearings on the medical arrangements to be made. But for the better understanding the usual medical requirements, and in order to be in a position to readily modify the arrangements under all possible circumstances, it will be well to give the abstract organisation of the normal or standard Indian army corps, and it is hoped the table over leaf may tend to elucidate the matter, and show at a glance the rationale of our Indian field hospital regulations.

An Indian army corps consists of three divisions of infantry, each with its own divisional troops. A cavalry division, and the corps artillery and engineers.

In all consisting of 21 regiments of infantry, nine regiments of cavalry, 15 batteries of artillery, and eight companies of sappers. The following table gives the detail, and from it, too, can be derived a synopsis or compendium of all possible field medical arrangements.

DETAIL of an INDIAN ARMY CORPS.  
TABLE No. 1.

	Officers and Men.										Total for Brigade.	Total for Division.		Staff of Divisions.	Guns.							
	Officers.				Warrant Officers, Rank and File.							B.	N.									
	B.	N.			B.	N.																

Strength of  
army corps.

From foregoing detail it appears a typical Indian army corps consists of 9,082 British and 17,202 Natives, or 26,284 of all ranks. It will be seen the staff officers and the 192 British officers with Native corps are all included in the 9,082 British, as they would be treated in the British field and general hospitals.

Hospital pro-  
vision.

The hospital accommodation for such an army corps is calculated at 12 per cent. on the total strength of both British and Native troops, and this would give 3,154 beds.

Ratio of field to  
general hospi-  
tals.

This 12 per cent. of accommodation is divided between field hospitals and general hospitals, nearly in proportion of four twelfths and eight twelfths respectively, or to speak more correctly of the 3,154 beds, 1,100 are given to field hospitals and 2,054 to general hospitals, being 34·88 per cent. of the total accommodation for field hospitals and 65·12 per cent. for general hospitals.

Field hospitals.

Of the 1,100 beds allowed for field hospitals, the British troops, including staff and British officers with Native corps, get 400 beds or four field hospitals, and the Natives 700 beds or seven field hospitals. This, as will be seen by calculation, is not quite in proportion to the strengths above given. The British portion getting 20 beds in excess and the Natives some 20 beds short, this arises from the fact that the lowest field hospital unit is 25 beds.

General hospi-  
tals.

Of the 2,054 beds allowed to general hospitals, 690 are allotted to the British and 1,364 to Natives; this also is not in proportion to strength, the British getting some 20 beds short and the Natives 20 beds in excess. It will thus be seen that the proper number of beds, viz., 1,100 is present in the field hospitals, and the full 2,054 beds are with the general hospitals, but the 20 added to the British field hospitals (in consequence of the field hospital unit being 25 beds) is taken away from them in their general hospitals, and *vice versa* for the Natives.

Beds for fol-  
lowers.

The 35,033 followers of the conventional army corps are allowed hospital accommodation at the rate of 3 per cent. on strength, or 1,051 beds in all.

Ratio.

This 3 per cent. is divided into field and general hospitals in the proportion of one third and two thirds respectively, or to speak correctly, of the 1,051 beds allowed, 350 beds are allotted to field hospitals and 701 beds to general hospitals (or  $\frac{1}{3}$  and  $\frac{2}{3}$ ).

Total accommo-  
dation.

The hospital accommodation, then, for our army corps, calculated at 12 per cent. for troops and 3 per cent. of followers, would be as follows:—

TABLE No. 2.

Hospitals.	No.	No. of Beds.
Field hospitals, British troops - - -	4	400
Field hospitals, Native troops - - -	7	700
Field hospitals, followers - - -	3½	350
General hospitals, British troops - - -	—	690
General hospitals, Native troops - - -	—	1,364
General hospitals, followers - - -	—	701
Total for army corps - - -	14½	4,205

The large number of followers, considerably more than one to every fighting man, has always been a problem for military men, and it is now usual to cut down the number to one follower per soldier, and the beds allowed in above to followers in general hospitals would thus be reduced to, say, 438 beds. The beds allowed to followers in field hospitals should not be interfered with as so many of them as kahars drivers, &c. have to go into action.

Russian army.

In the Russian army there are no kahars, no grass-cutters, no private servants; and in a conflict with it, we, with our army of followers, all requiring to be guarded as well as fed, would be at a great disadvantage; and it is considered by introducing the home system of bearer companies, medical staff corps, regimental bearers, and soldier servants there would be a great saving in the number to be sustained from our Cis-Indus base; and in operations in barren countries like Beluchistan and Afghanistan all such economy is desirable.

As before stated the proportion of British to Native troops is liable to change, and again referring to the detail it may be said the modifications would be chiefly in the divisional troops. British rifles or light infantry battalions being substituted for pioneers, European for Native cavalry, and mountain batteries, European or Native, for field batteries. It must be remembered the Native drivers with European mountain batteries are counted as fighting men.

The sick provision of 12 per cent. and 3 per cent. for followers, though considered quite enough under ordinary circumstances, would have to be increased if the season was peculiarly unhealthy, or the number of battle-field wounds likely to be large, and it might require extension to 14 or even 18 per cent. as in Egypt, with a corresponding increase for followers.

Sick provision liable to variation.

In defensive warfare the proportion of general to field hospitals, would be much in favour of the former, and *vice versa* in offensive operations, and the ratio  $\frac{1}{2}$  of field to  $\frac{1}{2}$  general hospitals would also be liable to modification. For instance, when an army corps is marching *en l'air* general hospitals would be altogether an impossibility; and it may be said the less secure the lines of communication, the fewer the general hospitals should be, and the great bulk of the sick and wounded would be treated in field hospitals in order to take advantage of the protection afforded by the army. Similarly, if our opponent was a civilized power like Russia, we might expect the Geneva Flag would be respected, and our unprotected general hospitals to remain unmolested; whereas with a barbarous and fanatical foe, such as the Afghans, our general hospitals should be kept within the range of our guns.

By the aid of the foregoing and detail table, we can readily calculate the amount of hospital provision required for a division, a brigade, a regiment, and even for a battery, or for any combination of the three arms of our army corps. The value of such a table to the Principal Medical Officer of the typical army corps will be apparent when we consider how often on field service the general officer in command issues orders for a force to be detached from the main body with some definite purpose. The detail of the column is generally given, but even if not, the Principal Medical Officer has only to refer to his table, and he can see at a glance the amount of hospital provision required, and can direct the Principal Medical Officers of divisions to prepare such hospital accommodation as he sees is necessary and with the divisions.

The detail.

For example, we want to find the number of field hospital beds required for the British troops belonging to a division.

British field hospitals for a division.

We say, if 9,006, the British troops, belonging to the army corps plus 76 staff are allowed 400 beds or four field hospitals, how many should be given to 2,360, the British troops, with a division, plus 20 divisional staff officers and five of the army corps staff, who it is presumed would accompany the division, or  $2360 + 20 + 5 = 2385$ .

Thus—

$$9082 : 2385 :: 400 = 105 \text{ beds, F.H.}$$

Similarly for British troops belonging to the brigades and divisional troops.

By adding the brigade staff 4 to 928 the European troops in a brigade, we get 932, and say—

$$9082 : 932 :: 400 = 41.04 \text{ beds, F.H.}$$

And for divisional troops—

504, the British troops, plus 12 for divisional staff, and 5 army corp officers presumed to be attached, or  $504 + 17 = 521$ .

Thus—

$$9082 : 521 :: 400 = 22.94 \text{ beds.}$$

Or British troops—

1st infantry brigade would require	-	41.04 beds, F.H.
2nd infantry brigade „ „ -	-	41.04 beds.
Divisional troops „ „ -	-	22.94 beds.

$$\text{Total for division} \quad - \quad - \quad 105.02 \text{ beds.}$$

which corresponds with what we found above, or 105 beds.

Native field hospitals for a division.

In like manner can be derived the field hospital beds for the Native fighting men of a division :

$$17202 : 4819 :: 700 = 196\cdot04.$$

Similarly for the Native troops belonging to the infantry brigades and divisional troops—

For brigades—

$$17202 : 1664 :: 700 = 67\cdot70.$$

For divisional troops—

$$17202 : 1491 :: 700 = 60\cdot67.$$

Or Native troops—

1st infantry brigade would require	-	67·70 F.H. beds.
2nd infantry brigade     "     "	-	67·70     "     "
Divisional troops         "     "	-	60·67     "     "

Total for division     -     -     196·07 beds.

which agrees with what we found to be necessary for the Native troops of the division, viz., 196 beds.

Cavalry division.

By a like calculation we find the British' portion of each of the brigades of cavalry would require 29·11 field hospital beds, and, taking the two brigades together, they would require 58·22, and the native portion of each cavalry brigade 44·76, or the two brigades together 89·52, while the corps, artillery and engineers, would give 26·64 field hospital beds for British troops and 22·17 for Natives.

Tabulating them, we find the number of field hospital beds required for an army corps to be—

TABLE No. 3.

Army Corps.	Number of Field Hospital Beds.	
	British.	Native.
1st Division - - - -	105·02	196·07
2nd Division - - - -	105·02	196·07
3rd Division - - - -	105·02	196·07
Cavalry Division and Corps troops - -	84·86	111·69
Total - - - -	399·92	699·90

Or only a fractional point below that allowed, viz., 400 field hospital beds for British troops and 700 for Natives, or total for fighting men 1,100.

Sections of field hospitals.

It is unnecessary to say the proportion of beds for each division, &c. in general hospitals is also obtainable by calculation from the table.

Now an Indian field hospital, British or Native, consists of 100 beds, and is separable into two divisions, right and left, each of 50 beds, and the divisions can themselves be split each into two sections, or four in all, named A, B, C, D. Each section contains 25 beds, and the section is the smallest unit of a field hospital.

Number of field hospitals with army corps.

In order, then, to see how the field hospitals allowed should be distributed to the different branches of our army corps, we must bear in mind the lowest field hospital unit is 25 beds, and allot 25 beds, or a multiple of it, or none at all. The preceding table, by the addition of the field hospitals for followers, is reconstructed thus :—

TABLE No. 4.

Army Corps.	Number of Field Hospitals.			
	British.	Native.	Followers.	Total.
1st Division - -	1	2	1	4
2nd Division - -	1	2	1	4
3rd Division - -	1	2	1	4
Corps, Artillery and Sappers, Cavalry Division.	1	1	$\frac{1}{2}$	$2\frac{1}{2}$
Total - -	4	7	$3\frac{1}{2}$	$14\frac{1}{2}$

We can readily reckon from the detail how many and what field hospitals or sections thereof should accompany any given force; but, speaking generally, field hospitals attached to divisions should be equally divided between the infantry brigades. And in any splitting up of field hospitals it is well to remember Sections A and B or the right division is better equipped than the left division, Sections C and D, and that next to A Section C would be the most independent, then B, and D least. Section A should be always the headquarters of the field hospital.

There is no separate medical or hospital establishment allowed for field hospitals for followers, their requirements are met from and they are treated in the Native field hospitals.

Followers treated in Native field hospitals.

The regulations regarding field hospitals, their establishment and equipment, their position in camp, and on the line of march, will be found at paras. 39-75A, Indian Army Circulars, 1884, clause 82, and clause 171 Army Circular, 1885, and their appendices.

It is contemplated in the regulations that British and Native field hospitals, or sections thereof, might be combined or encamped together, and it may be remarked there is but little difference between British and Native field hospitals in respect to medicines, surgical instruments, appliances, books, necessaries, stationery, and furniture, whereas they differ considerably in regard to personnel, camp equipage, clothing, and dieting. Anyone acquainted with the habits and customs of the natives will know where to look for disagreements in scale, and in cases of emergency many articles can be borrowed and deficiencies made good.

Field hospitals are equipped only for three months, and all expenditure from the stores authorised for corps units will be replenished from the field hospital stock. The mode of packing, equipment, transport, and weights of the different packages, comprising British and Native field hospitals, will be found in the Report of the Field Hospital Committee, Calcutta, 23rd February 1885.

Equipped for three months.

Field hospitals are intended for the treatment of the sick and wounded of the force to which they are attached; beyond the first dressings applied by the medical officers with corps, and by the bearer column or company at the dressing station, all operations and other necessary treatment of the sick and wounded of the fighting line is carried out in the field hospitals, and here the wounded get, for the first time, comparative rest and comfort after the heat of action.

Field hospitals must, therefore, be pre-eminently mobile, and should conform with the general formation of the force, and only become stationary, when from the number of sick and wounded, or from want of transport, they cannot be moved, and as soon as these impediments can be rectified must immediately join the force.

Field hospitals mobile.

Unlike the arrangement for a purely British force acting against a European power, there is no separate bearer company organisation. The Indian bearer column or company is merely a portion of the field hospital equipment and establishment, pushed forward to the fighting line, for the purpose of succouring the wounded near or where they fall, and conducting them to the field hospital, an Indian field hospital itself performing most of the functions of

No bearer companies.



**Rations.** the large dressing stations of European armies. As soon as the bearer column brings in the wounded it merges into its field hospital. Each field hospital should be able to equip two bearer columns. The regulations for bearer columns, the orders for the formation and position of dressing stations, together with detail of a bearer column, are to be found at paras. 58-70, clause 82, and Appendix, Army Circular, 1884. Patients taken into field hospitals bring their arms, kits, accoutrements, bedding, clothing, diet utensils, and unexpended portion of their day's field ration with them. While in hospital field rations will be drawn by the medical officer in charge and will be cooked under medical instructions. The field ration thus treated is supplemented by such medical comforts as may be necessary from the field hospital stock.

See note Appendix E., page 47, Field Hospital Regulations on Subject of Diet for European and Native Sick.

**Bedding.** A small quantity of bedding, clothing, and diet utensils are allowed on the field hospital scale for special cases.

Dandies are used for the sick and wounded to lie on, and when the number of dandies is insufficient 12 lbs. of straw and a waterproof ground sheet is issued to each patient.

The slightly wounded and those sufficiently recovered before the field hospital requires to be evacuated in anticipation of an action will return to their corps, but the seriously and severely wounded and those not likely to become effective within a reasonable time should be sent to the base.

Patients in field hospitals being still in the immediate vicinity of their corps, all malingerers must be stopped here, as it is hopeless to expect to get them again to the front once they have been passed to the rear.

**Way-side hospitals.**

To admit of the regular and systematic evacuation of sick from front to base, or from field to general hospitals, rest-dépôts or *etappen* hospitals are established along the lines of communication where the sick and wounded may rest and have their requirements attended to. They are also of great use to troops advancing to the front in rapid relief. These troops being supplied with but little ambulance can drop those too sick to travel at the rest-dépôt, where they remain until they are sufficiently well to rejoin their corps or be returned to the base, and the smaller the proportion of sick carriage in the possession of corps the greater need for rest-dépôts along the line of route.

Buildings, when practicable, should be used for rest-dépôts, and if not available tents of the heavy camp equipment character should be issued.

**Rest-dépôts.  
Distance.**

The general officer in command directs where the rest-dépôts should be formed, but the usual rest-dépôt distance is about 20 to 30 miles apart by road, and if no ambulance railway carriages are supplied about 100 miles by rail.

Regulations for rest-dépôts will be found in paragraphs 71-74, clause 82, Army Circulars, 1884.

It will thus appear rest-dépôts are stages between the field hospitals at the front and the general hospitals at the base and on the lines of communication.

**General hospitals.**

As the field hospital aims at quickly putting the sick or wounded man in a place of safety and *comparative* comfort, the object of the general hospital is to afford him every comfort, convenience, and aid to recovery which the circumstances of warfare will permit of. With this end in view, general are worked like station hospitals, having all the necessary appliances, surgical, medical, and dietetic. They are dieted hospitals established at the base of operations, or other suitable locality on the lines of communications, for receiving the sick and wounded from the front, and for replenishing the stores of hospitals in the field.

**Military dépôt.**

Each general hospital has a pack and accoutrement store and a medical store attached to it, and dépôts for British and Native troops are established in its vicinity, to which discharged men can be sent, and from which necessaries for those in hospital can be provided.

As field hospitals are intended for the treatment of men of its own force, general hospitals are for the treatment of men detached from their corps or division.

**General hospitals when advanced.**

Field hospitals must be prepared to move at a moment's notice with their own force, whereas general hospitals are for the most part stationary, and are only advanced as the whole or a great part of the army corps advances.

Whenever practicable buildings should be utilised for general hospitals, otherwise heavy camp equipment tents. General hospitals are equipped for six months, and must replenish the field hospitals from their stores.

All general hospitals are based on the scale of 100 beds for Europeans and 100 beds for Natives. Officers, warrant officers, and Native officers are admitted into general and field hospitals, and are allowed separate accommodation.

Orders for choosing sites for general hospitals and other regulations affecting them will be found in paras. 1-14A, and Appendix, clause 82, Army Circulars, but it may be stated general hospitals, when practicable, should be in open spaces near towns, and not inside fortresses or fortifications, and small general hospitals in very advanced positions would be in reality only large rest-depôts or *etappen* hospitals, and the number required would depend on the length of the communication line.

It will be seen from above account the general hospitals on field service in India answer the purpose of "advanced depôts of medical stores," "stationary hospitals on the lines of communication," "general hospitals at the base," "with military depôt attached," and "depôt of medical stores at the base" of the home army. The great difference being that in the home army the medical store depôts are not attached to hospitals, but are under the principal medical officers of the base and communication line, independent organisations, and that there is a military depôt attached to *each* general hospital in India. General Orders, No. 30, 13th April 1885, says the military depôt "will accompany the hospital on active service when and where it may be moved or established." It is not quite clear why *every* general hospital should have a military depôt with it.

It now only remains to be said each corps-unit has a medical officer and medical subordinate attached; the equipment, together with rules for guidance, will be found at paragraphs 28-38, clause 82, Army Circulars, 1884.

While the medical officers with corps-units should not allow sick or unfit men to remain with the corps and encumber the front, they should do what they can to prevent shamming and scheming, and no man should be sent to hospital for treatment unless he requires it; with the field panniers now supplied most trivial cases can be dealt with. It should be remembered a picked strong mule must be given for the panniers, as they weigh a stone more than the usual mule load.

To recapitulate, then, a man falling severely wounded in battle is tended by the medical officer with his corps until the staff of the bearer column arrives.

Field dressings (Appendix D., clause 82, Army Circulars, 1884) are issued to 10 per cent. of fighting men; these, with the other surgical materials at his disposal, are applied by the medical officer with corps, and in this he is assisted by medical officers attached to other corps of the same division which are not engaged.

When the staff of the bearer column arrives, the wounded man is removed to the dressing station, thence to the field hospital, which has been so placed as to preserve touch with the fighting line. The dressing station should be beyond the range of rifle fire, and the field hospital wide of artillery distance.

From the field hospital he is sent to the general hospitals on the line of communication, thence to general hospital at the base of operations, halting on his way from time to time at the rest-depôts.

We now come to the all important subject of transport, and unless this is efficient our field hospital regulations are mere *tabula rasa*. Two kinds of transport are allowed to the hospital service, viz., transport for material and ambulance or sick transport; oddly enough, and in curious contrast with what obtains at home, neither kind of transport is under the control of the medical officer, but is administered and controlled by a distant divisional or brigade transport officer. This system is sure to lead to friction, and consequent loss of efficiency in actual warfare; even now we have the confusion and ambiguity of the "bearer column" of the transport officer and the "bearer company" of the medical officer. The whole aim of modern transport is to confide the necessary transport to commanders of corps-units, and to charge them with the responsibility for the mobility of the corps. Why then should field hospitals, whose *raison d'être* altogether depends on mobility, be expected to succeed when failure seems unavoidable?

Corps-units.

Shamming.

Surgical assistance.

Transport.

The medical officer should command the transport.

Whatever sophisms may be cited in favour of disuniting the medical officer in charge of a field hospital from his ordinary transport, he should, in common reason, have command and undisputed control of the ambulance transport, both animal and manual.

Anyone acquainted with the present plan, even in peace time, can see what little grip the surgeon has over the ambulance, and indeed the same may be said of the absentee transport officer. The irregularity in payment of the men, and the confusion arising from so many possible masters, is so deterrent, few good kahars can be induced to join; and those now entertained—being chiefly employed in punkah pulling, shifting commissariat stores, tending government gardens, and such like coolie work—have forgotten whatever they knew of sick bearer work. It may be said the “new hands” are not good, and the “good ones” are too old. The scheme for ambulance sanctioned (No. 1376C., Medical Department, Ambulance), though complete enough in itself, is, in the writer's opinion, the play without Hamlet, and he thinks no matter how elaborate and apparently perfect the plan may appear, if the surgeon's authority is not paramount the ambulance will break down.

He is convinced the system will snap and collapse when war is actually upon us, but fears it will be unfortunately then too late to improve it, and the shortcomings will be laid at the door of the field hospital arrangements, and administrative and executive medical officers will be blamed for a breakdown which they foresee, but are powerless to avert.

Be this as it may, the field ambulance allowance is 5 per cent. on strength of troops, and 1 per cent. on that of followers. This sick carriage is divided into dandie and animal carriage thus—

TABLE No. 5.

Troops.			Followers.		
Dandie	-	3 per cent.	Dandie	-	$\frac{1}{2}$ per cent.
Animal	-	2 „	Animal	-	$\frac{1}{3}$ „

The camel.

The animal to be the one most suitable to the country, and the camel has been chosen for Afghanistan. The camel is probably much inferior to mules, ponies, donkeys, or even pack-bullocks for sick carriage, and anyone who has seen a camel with his kajawah carry a couple of sick men must be struck by his stubborn ungainly gait, shaking the occupants with every step he takes, and making their giddy perch a most undesirable seat; when used they should be equipped with the English cacolets and litters, and would be very useful on a desert march, such as an expedition through Nushki into Registan, to repel any attempt to turn our left flank by a march across the vast sandy plain extending from the Helmund towards Kelat.

Ambulance for cavalry.

In modern warfare cavalry are frequently many days in advance of the main body of an army, and the question of ambulance for them, especially during forced marches, presents many difficulties; if the pace is slow the dandie can keep up pretty well; but in rapid movements, such as those undertaken for the seizure of advantageous strategical positions, some speedier means must be adopted; as a rule, wounded troopers are brought on between two comrades, thus depriving the force of the services of two men, in addition to the disabled one. Cacolets carried by the galloway, known as the mounted infantry pattern, a strong solid little horse of about 14 hands, would, under ordinary circumstances, be able to keep pace with the cavalry, and if trained this class of animal could be used for litters, usually the animal might be led by a man on foot, or if greater speed was necessary, by a mounted man, or the driver could occupy the off cacolet or litter, only one patient being taken.

Camels could also be used in a similar manner for this service, but their swinging gait would make the litter or cacolet far less comfortable travelling. The big mules in India are all taken up for mountain artillery, and the small ones, 11 to 12 hands, would not be suitable for the English cacolet or litter. If, therefore, mules are to be used with mountain equipment in this country, a special class of animal is necessary.

For infantry, if carts cannot travel, the mule, the pony, the donkey, can be used as pad animals. Some of the donkeys about Quetta can carry as much as 16 or 17 stone, their small size, docility, and the readiness with which they find their own fodder render them very useful and suitable as sick carriage; or litters of various kinds might be constructed, such as the one in use in Persia, which consists of a palanquin slung between two mules or ponies; a native charpoy, with the legs up, may be used across the back of a pad animal for conveying a man lying down.

However, there is a good cart road all the way to Kandahar, and light service carts with mule transport would be the best mode of conveyance for all but the seriously sick or wounded.

Broken limbs and serious cases will usually require carriage by hand, and the Lushai dandie with cover is now authorised for field service, the usual number of bearers was four per dandie, but it is understood in future five will be supplied with each dandie in operations beyond the Indus. Two chaguls are issued with each dandie, and it should be seen that they are filled with fresh water before starting, and at the outset of a campaign it should be ascertained if they hold water. To make them effective when new they should be soaked in water, and then greased. New puckal mussaks should be similarly treated.

The wheeled carrier for the dandie would be of great service where the roads were tolerably good, and would even over rough ground be easier for sick men than dandies carried by inexpert bearers; the carrier could only be used on the lines of communication and should not follow a force into the field.

If possible the transport, as well as the personnel and materiel of field hospitals, should be kept together from the outset, and start by train as complete units. In his evidence before the Earl of Morley's Committee, Deputy Surgeon-General Ekin, C.B., says, "On the march down from Kabul to Kandahar we were much more independent in this way; we had our field hospitals equipped; we had our carriage entirely in the hands of our medical officers, and that carriage was provided for us before we started;" thus equipped they were able to provide ambulance transport of some kind for the 800 or 900 sick brought into Kandahar.

At present the hospital transport is not in the hands of the medical officers, and as it is feared, in view of the confusion and on the plea of more pressing necessities elsewhere, it will be made up of all kinds of carriage, the following table gives the carrying powers for field hospital purposes, expressed in lbs. and coolie loads.

TABLE No. 6.

Description of Carriage.	Lbs.	Equivalent expressed in coolies.
Camel - - - -	320	As much as eight coolies or two mules.
Mule or pony - - -	160	As much as four coolies.
Pack bullock - - -	160	As much as four coolies.
Light cart - - - -	480	As much as 12 coolies.
Army transport cart - - -	960	As much as 24 coolies.
Donkey - - - -	120	As much as three coolies.
Coolie - - - -	40	

If a field hospital is supplied with different kinds of carriage, the mule would be the most moveable, coolies next, camels last; to ensure efficiency all should be mules, and whatever description is issued a per-centage of spare animals should be sent, and it must be remembered mules and banghy burdars should be supplied for the field panniers and petarrahs, and the mules should be strong ones.

It is confidently hoped, ere long, the hospital transport, both general and ambulance, will be as complete as that of a mountain battery; that it will be under the command and control of the medical officer assisted by his staff. The medical warrant officer who takes the dandie parties into the field of

action would be the most appropriate man to have subordinate charge of the kahars.

1st Army Corps  
for Peshin  
warned last  
spring.

To apply the foregoing principles to an army corps ordered to be mobilized for service in Beluchistan and Peshin. We have seen how the composition of the force may be altered, and it may also be increased by the addition of a British infantry regiment to each brigade or six altogether, and by the addition or substitution of mountain artillery. The strength and composition of an army corps is settled by Government, for instance, the strength of the army corps ordered to be mobilized last spring differed from one and other. The 1st Army Corps, which was evidently from its composition intended for an advance on Kandahar or farther, consisted of 27,841 troops, viz., British 12,425 and Native, 15,416, with 27,833 followers; the hospital provision was 12 per cent. for fighting men, or 3,341 beds, and 3 per cent. for followers, and this accommodation, both for troops and followers, was divided into  $\frac{1}{12}$  field and  $\frac{7}{12}$  general hospitals.

By calculations similar to those already indicated we find 1,392 beds were allotted to field hospitals and 1948·9 for general hospitals. But when we express the 1,392 beds in field hospitals we find there are 13 complete field hospitals and 92 beds over, as before stated the lowest field hospital unit being 25 beds, this gives us then  $13\frac{1}{2}$  field hospitals and 17 beds over, which, is added to the general hospitals, or 1965·9 or 1,966, which was the actual general hospital provision. So much for the troops, now for the followers: the 27,833 at 3 per cent. would give 834·9, they were allowed 835, this divided into field and general hospitals in the proportion of  $\frac{1}{12}$  and  $\frac{7}{12}$  would give 347·9 for field and 487·08 for general hospitals; the 347·9 beds expressed in field hospitals would be three complete hospitals and 47·9 beds over; but as the lowest field hospital unit is 25 beds, the 47·9 beds are taken as 50, making  $3\frac{1}{2}$  field hospitals, and the two beds thus added are taken from the general hospital beds, making the latter 485, or all told  $17\frac{1}{2}$  field hospitals or 1,725 beds, and 2,451 beds in general hospitals for the 1st Army Corps.

In using table No. 1, and referring to the different Presidency's army lists, the establishments of corps will be found and substitutions can be readily made, but it must be borne in mind that Native drivers of European mountain batteries are counted as fighting men not followers.

Hospital pro-  
vision for Burma.

From paragraphs 1, 2, and 42, clause 82, Army Circulars, 1884, it will be seen the whole hospital provision, as well as the proportion of field to general hospitals, is, together with the position of the latter, settled by the responsible officers of Government; for example, for the present war in Burmah the hospital provision was 10 per cent. on strength for troops and 2 per cent. on strength of followers, and the proportion was  $\frac{1}{10}$  field and  $\frac{9}{10}$  general hospitals and the general hospitals to be established at Thayetmyo. Enough has been said in the foregoing to indicate the different factors likely to be taken into account by them, in fixing the composition of the force and hospital provision.

Supposed army  
corps, its object.

For the purposes of this paper we will suppose the army corps, whose strength and composition is given in Table No. 1, and which in a measure may be taken as a prototype, has been ordered to be mobilized, that the hospital provision has been fixed at 12 per cent. for troops and 3 per cent. for followers, and that this accommodation has been divided into  $\frac{1}{12}$  field and  $\frac{11}{12}$  general hospitals, and the beds distributed as in Table No. 2. We will assume the object of the force to be defensive generally, trusting to the home army making an attack on the Russian line by way of the Black Sea or elsewhere, and always being in a position not only to resist attack, but to meet the enemy when numbers and strategical standpoints were in its favour, and to follow him up when defeated; and we will further take it for granted the present Quetta force—but with its own hospital provision—would assist in keeping open the communications, and thus free as much of our army corps as would be sufficient to cling to the Kojhak line with pertinacity to offer a stubborn resistance to a Russian foe advancing from the Helmund through Kandahar, and to give battle in the open if necessary.

The Principal Medical Officer of such a force should be a strong and active man, and he should be consulted as to the appointments of the Principal Medical Officers of Divisions, and as far as practicable the patronage of appointments to field and general hospitals should be placed in his hands, and his wishes as to medical staff appointments generally complied with. Nothing

is so calculated to make the machine work evenly and smoothly as a thorough knowledge of all its component parts by the foreman. When medical officers know and feel their advancement, their hopes of honours and decorations and rewards, depend on the word of the Principal Medical Officer they are much more likely to render him that loyal and willing support without which success is unattainable. General rules for administration will be found in paras. 22-27, clause 82, Army Circulars, 1884, and Appendix. A Principal Medical Officer for the cavalry division, as well as administrative staffs for the base and communication line, would be most desirable, and it may be mentioned the number of medical officers in reserve in the field hospitals or on field service generally is inadequate or so barely sufficient that the least casualty causes men to be transferred from one kind of duty to another just as they were becoming useful at their present posts, and it should be a golden rule of active service that no man should be moved from any hospital, post, or corps unless for promotion, the good of the service, or at his own request.

Appointments.

Paucity of medical officers.

Medical examination.

Immediately the orders for mobilization are promulgated all ranks and followers, both public and private, should be medically examined, so that no man would accompany the force who is likely to fall sick and encumber the army; the medical officer in charge of the hospital where the men are treated, as well as the medical officer who will have permanent medical charge of the corps, should be members of the board, and it must be kept in mind that many healthy men are disinclined for service and "weeds" are frequently keen on going, and in neither case should their wishes be met.

The troops of our army corps would be drawn for the most part from Bengal, the Punjab, and frontier force, but doubtless Bombay and Madras would send their quota.

Troops whence drawn.

Now there are in India exactly  $14\frac{1}{2}$  field hospitals already prepared for service, viz., four British and  $10\frac{1}{2}$  Native, or the quantity required for our army corps. Those on the frontiers, 1 British and  $3\frac{1}{2}$  Native, are in every way complete for service; while the remainder, or those from army corps areas, have all the packages ready and require only to be filled, and could, being on the lines of railway, be easily trained to Mach in the Bolan.

 $14\frac{1}{2}$  field hospitals are ready for service.

With the exception of No. 3 British Left Division at Rangoon, No. 11 Native Eastern Frontier, and No. 13 Native at Rangoon all the field hospitals would be at once available, and orders should be sent to Madras and Bombay for the dispatch to Mach of their field hospitals.

The 2 Native and  $\frac{1}{2}$  British required to complete the  $14\frac{1}{2}$  field hospitals could be procured at Quetta, where it is understood 3 British and 3 Native field hospitals got ready last May are now stored, or these 6 hospitals might be first requisitioned, the remaining  $8\frac{1}{2}$  being obtained from the frontier and army corps areas.

Field hospitals stored at Quetta.

The medical officer in charge, assisted by the warrant officer in sub-charge, should at once take over the equipment and, if possible, the transport, satisfying himself as to their completeness, reporting the same to the Principal Medical Officer of the army corps.

There need, then, be no trouble or confusion in equipping our army corps with its  $14\frac{1}{2}$  field hospitals. Those required from the Quetta reserve should be pushed on to Chaman, where a strong force must be maintained, and one English and three Native field hospitals would be required there. The field hospitals from India having been railed to Mach should be moved on to Quetta, Peshin Fort, Sayud Hamid, Gulistan, and Killa Abdulla. Or if the troops derailed at Mach were marched thence in brigades, the requisite complement of field hospitals should accompany them. Similarly, if troops marched up the Harnai route by brigades, the necessary field hospital accommodation for the force having been railed to Kilat-i-Kila, should march with its force to Peshin by way of the Chappar Rift and Kach. On the march field hospitals, both British and Native, should be close up to the column, and on no account must regimental baggage be permitted to forge ahead of them.

No trouble about field hospitals.

To train such an army corps to Mach would take some 30 days, and it would be well to have some wayside hospitals or rest-dépôts provided, and general hospitals established before the arrival of the army corps. Unfortunately the hot weather is the time of the year such an army corps would be put in motion, for the enemy could only begin his advance when the winter snows of Afghan Turkistan had melted.

General hospitals from the three Presidencies.

The equipment for the general hospitals required should be obtained from the three Presidencies, and it should be borne in mind that the scale is 100 beds, Europeans, and 100 beds, Natives, and that all general hospitals formed either at the base of operations or in the field or elsewhere must be based on this scale.

Indus River our base.

The Indus line would be the natural base of such an army corps. All stores, munitions of war, men, materials, and food should be derived from the east of this river, and in case of defeat it would be the position taken up by the army for a further stand.

We have stated that the army corps should have 2,054 general hospital beds for troops and 701 for followers, or, if the followers be reduced to one per fighting man, 438 beds, or a total of 2,492; and of this 2,492 beds, 690 would be reserved for British troops, and the remaining 1,802 for Native troops and followers. The following table gives the position and number of beds of the different general hospitals, European and Native.

TABLE No. 7.

General hospitals. The followers are treated in Sepoy's hospitals.

2,492 Beds.			
	B. 690.	N. 1,364.	F. 438.
Lahore - - -	150	250	100
Kurachi - - -	100	150	50
Ruk Junction - - -	—	200	100
Mach - - -	50	100	—
Quetta - - -	280	464	188
Kilat-i-Kila - - -	—	100	—
Sharg - - -	50	—	—
Syud Hamid - - -	60	100	—
Totale - - -	690	1,364	438

Lahore hospitals.

The hospitals at Lahore would be used by the Bengal troops and their followers, and from there British soldiers could be sent to the different sanitarium of the Himalayas; those belonging to the Punjab being sent north to Muree, &c., and others to Dugshai, Kasouli, Laudour, &c. The Sepoys dispatched by rail to their depôts or homes, and the followers to their homes.

Kurachi hospitals.

The hospitals at Kurachi would be available for British troops invalided to England, and for British and Native troops and followers of the Madras and Bombay armies.

Hospital at Ruk Junction.

The hospital at Ruk Junction would be for Natives only, and here the Sepoys and followers of the Bengal troops proceeding north to Lahore could be separated from those of Madras and Bombay going *via* Kurachi.

Hospitals at Mach.

The hospitals at Mach would be for the convenience of troops embarking or detraining there.

Quetta hospitals.

The Quetta hospitals would be for the reception of sick and wounded from the army of observation in Peshin.

Reinforcements in by Bolan. Sick out by Harnai.

The hospital at Kilat-i-Kila for Natives only would admit men going up and down the Harnai line, and the British general hospital at Sharg would do the same for Europeans. If there was much press in the Bolan in consequence of the hurrying up of reinforcements or supplies, the Harnai route could be used for the sick returning to the Indus, thus establishing an "in" and "out." Under such circumstances the hospitals at Sharg and Kilat-i-Kila would be very handy.

Hospital for the Chaman force.

The small hospitals at Syud Hamid would afford rest, shelter, and comfort to the sick of the Chaman force after the trials of their return journey over the Kojhak; they should, however, be passed quickly back to Quetta.

The Quetta hospitals should be in buildings, and indeed the same may be said of the others; when buildings are not available hastily constructed huts of sleepers, railway iron and mud would be preferable to E.P. tents.

Diets.

The hospitals at Lahore and Kurachi could be fully dieted, but at the others there should be only two or three diets to choose from; milk, low and

full, would answer very well, any other articles required should be made up from medical comforts or extras; an ample supply of peptonised cocoa and milk for cases of enteric fever and dysentery should be available.

Along the line of railway the cantonment hospitals at Mooltar, Sukkur, and the like, should be utilised as rest-depôts when required, and it would be well to organise sanitary trains for the accommodation of sick convoys. Similarly rest-depôts should be formed along the Harnai and Bolan routes, and between Gharkai and Killa Abdulla, and between the latter place and Quetta.

General rules for sanitary guidance in the field will be found in the Bengal Medical Regulations, Sec. 17, paras. 60-82. The medical officers with corps units are sanitary officers to the corps, and one of the medical officers of each brigade should be nominated for charge of the brigade staff, and be charged to look after the sanitation of the brigade. The Staff Surgeon of each division would, under the Principal Medical Officer of the division, act as sanitary officer, and the Principal Medical Officer of the Army Corps should be assisted in sanitary duties by a special medical officer; but it must be understood the Principal Medical Officer of the Army Corps is himself the sanitary officer, and the others only his assistants, and the rule is that the senior medical officer on the spot is the sanitary officer.

In consequence of the barrenness of Afghanistan and the scarcity of vegetables scurvy is very common, and so is scorbutic dysentery. Lime juice should be issued to Europeans and *amchur* to the Natives; this latter, as its name implies, consists of peeled mangoes. The green mangoes are peeled, the stones removed, and the cut pulp is sun-dried. Sixty-seven grains of *amchur* contains 10 grains of citric and malic acids, and are, therefore, equal to one ounce of lime juice. The *amchur* is used as a condiment, and can be substituted for lime juice when scurvy is present. In the writer's opinion either of these anti-scorbutics should form a part of the daily ration in the field; it is the only way to prevent scurvy, and it should be borne in mind the inception of this and its allied diseases is frequently very obscure.

It is usual to issue a meat ration at least once a week to Native soldiers, and no doubt it is very beneficial; it may be added, too, that on field service the Native frequently sees the necessity of abandoning some of his prejudices about food, and under the name of medicine will take anything, from rum to extractum carnis, when sick.

No. 3 Field Hospital, of which the writer had charge during the last war, was partly European and partly Native, and he found no difficulty in the management of them with regard to food. One precaution he would advise, viz., that great care should be taken to keep the arms and ammunition separate; there is not much likelihood of there being a mistake about the arms, but the Boxer cartridges in paper are not unlike the Martini-Henry, and he has seen the substitution of one for the other.

Rest-depôts should invariably accommodate Natives as well as Europeans; they can be kept a little apart; but one medical subordinate and one hospital assistant should be allotted to each, then one medical officer could readily manage all.

As the limits of this paper will not allow anything like a detailed description of the chief diseases likely to arise on field service in Beluchistan and Peshin, nor yet the best mode of their prevention or cure, the writer takes the liberty of referring to the Director General, Sir Thomas Crawford's memoranda for the Suakin Force, Army Medical Department Report, 1883. It treats of antiseptics, sanitation, wounds, diseases, and disinfectants, and everything said in that article will, *mutatis mutandis*, apply with equal force to campaigning in Afghanistan. In dealing with the hospitals of an Indian army corps it will be best, for a time, to altogether abstract, in the logical sense, the difference in race, for as far as hospital provision is concerned they are alike, and thus viewed there is but little difference between the home and Indian regulations.

With respect to field hospital equipment, the carpenters' tools should belong to the hospital and not to the carpenter, by the time the carpenter joins the hospital he has either lost or sold most of his tools; it would be easy to select suitable ones from the stock of any good Native tradesman; and such tools as tinker's scissors, drills, triangular files, punch with matrix, and wire cutter would be

Rest-depôts.

Sanitation.

Scurvy.

Amchur.

Europeans and Natives were treated in No. 3 field hospital.

Ammunition.

Suakin. Memoranda.

Tools for improving.



found very handy in improvising hospital appliances. Each field hospital should also be supplied with some native reaping hooks, called "darati;" they would be very useful in clearing the ground for encampments and other purposes.

**Kerosine oil can.** The empty kerosine oil tin writer found most useful, it is only necessary to set fire to the few remaining drops of oil in it, wash it out, and it can be used for boiling water, and being so thin it is peculiarly adapted for this purpose in a country where firewood is so scarce. A board with a hole in it, placed over the tin, makes an excellent commode, which article is most necessary in a country, where, in addition to camp diarrhoea, the drinking water is in many cases purgative. The tin makes an excellent filter, cut into strips can be used for splints, opened along the length it makes a good water trough for surgical cases; in fact, it would be endless to enumerate all the uses it can be put to, no other can is so serviceable.

Broken bamboo poles of tents make good water pipes; rails, and sleepers, good huts, "boosa," good beds, and many other articles might be mentioned, which come in handy, and on this subject of "improvisation" reference should be made to Appendix VI., Army Medical Department Report, 1883.

**Returns.** No matter what efforts are made to keep down correspondence and returns, there will always be a considerable quantity of both. Unfortunately the writers supplied from corps are usually very bad, and the medical officer has to do most of the office work himself. Junior medical subordinates, with a small staff salary, could do the work efficiently in addition to their own; and a typograph for issuing orders, when several copies are required, would be very useful to Principal Medical Officers.

**Importance of strategic knowledge.** Having settled, then, the number, position, and sources of supply of our general hospitals, it now only remains to be said where our field hospitals should be placed, as before stated they must preserve touch with the brigades or divisions with which they are associated; if buildings are available near the scene of action they should be utilized, especially when they become immovable; and in order to foresee where field hospitals are likely to be wanted, and be in a position to anticipate the possible hospital requirements of different developments, the Principal Medical Officers should have clear conceptions of the nature, scope, and object of the operations likely to be undertaken, and they should not only make themselves acquainted with the medical-topography of the country, but should also study it from a strategical point of view.

Their calculations and designs would be more perfect and intelligent by the knowledge: that for the defence of the Kwaja Amran range it would be necessary to have a large force at Chaman; that the Kojhak, the Roghani, and the Gwajha defiles would have to be guarded; that the main body of the army corps would be drawn up on the Gulistan-Killa Abdulla line for battle, and in the event of the enemy forcing the range, and on his emerging from "the dark shadow yonder that marks the pass mouth," would be ready to fall on him in flank; that in case of defeat we would retreat on our supports at Quetta by way of the main road over Gazardband Pass, and that retirement would also be possible across the plain of Peshin to Kach, and down the Harnai line; and that if the conflict at the foot of the mountains resulted in our favour, and the enemy thrown back on his stores, guns, and baggage, retreated in disorder on Kandahar, it would be our duty to follow him up with vigour and crown our victory.

## APPENDIX No. IV.

AN INQUIRY INTO THE RELATION OF MALARIA TO PHYSICAL CAUSES AT MEEAN MEER, PUNJAB: WITH AN ANALYSIS OF SOIL AND WATER, AND A *RESUMÉ* OF METEOROLOGICAL OBSERVATIONS.

By Surgeon R. H. FIRTH, F.R.C.S. Eng., Medical Staff.

"The philosophy of medicine is, I think, almost at zero. The theory of life itself is probably beyond our knowledge; so, probably, is that of the origin of thought and perception. But, coming down to a far lower point, how ignorant are we of the causes of disorder, of the real influences of air, soil, and their component parts in affecting health, infection, and those strange phenomena of diseases affecting the human frame."—ARNOLD.

With, perhaps, two exceptions no station in India possesses a greater notoriety for unhealthiness than the cantonment of Meean Meer. For many years it has been remarkable for the intensity of its malarial fevers; though much less unhealthy than in former years it still is open to much improvement. Arriving in the station in the autumn of 1884 I was particularly struck with the high rate of sickness of the European troops from paroxysmal fevers, and also with the extraordinary effect malarial influences had had upon the men of the European regiment quartered there. This regiment (1st East Lancashire) had been located in the cantonment for two years, and had been rendered practically unserviceable, owing to the exhausted and debilitated state of the men. So impressed was I with the condition of the troops, that I determined to institute observations upon the meteorology and telluric influences of the station with a view to see what relation, if any, they had to the prevalence of malaria. Sending to England at once, I was able to receive from London such instruments as I required, and was prepared to commence my observations from the beginning of the year 1885. It is not my intention in this paper to advance hypotheses as to the nature of malaria. The subject has been threshed out over and over again, and the annals of medicine are full of learned views on the subject. Hippocrates,<sup>1</sup> Aretæus,<sup>2</sup> Paulus Ægineta,<sup>3</sup> Alsus,<sup>4</sup> Avicenna,<sup>5</sup> Lancisi,<sup>6</sup> Pringle,<sup>7</sup> Lind,<sup>8</sup> Annesley,<sup>9</sup> Ferguson,<sup>10</sup> Parkes,<sup>11</sup> Morehead,<sup>12</sup> Ranald Martin,<sup>13</sup> Aitken, Niemeyer, and Oldham have all discussed the nature of malaria. The general idea as to its nature is well expressed in the words of Parkes, "a putrescent, or at least a decomposing vegetable matter derived from a moist and putrescent soil, which is carried to the body by the medium of water and of air." Oldham, in his work on malaria, does not accept this theory, but believes that all the phenomena are explicable as results of "*chill*." While, too, a recent French observer<sup>14</sup> substitutes for the term malarial miasma, the euphonious expression *thermo-electro-hygrometric influences*. Adopting the maxim of Sir Richard Phillips, that "facts are the data of all true reasoning, and the primary elements of all real knowledge," I, with a full consciousness of their imperfections, submit such facts as I have been able to obtain concerning the relation of malarial prevalence to physical causes in the hope that they may be found a worthy contribution to the sum of facts which meteorologists throughout the world are now collecting for the solution of the many present obscurities in the etiology of disease.

<sup>1</sup> Syd. Edit., ii., 3, 715-720. <sup>2</sup> De Differentiis Februm, Lib. i., cap. 6. <sup>3</sup> Syd. Edit., Lib. ii., 373. <sup>4</sup> De Medicina, Lib. ii-1. <sup>5</sup> De Febr. Putridis, Lib. iv., 1, 1608. <sup>6</sup> De Noxiis Paludum Effluviis, Lib. i., cap. 4. <sup>7</sup> Diseases of Army, Part iii., cap. 4. <sup>8</sup> Putrid Fevers in Bengal, p. 39. <sup>9</sup> Diseases of India, p. 49. <sup>10</sup> Trans. Roy. Soc. Edin., Vol. IX. <sup>11</sup> Hygiene Manual. <sup>12</sup> Disease in India, pp. 4-5. <sup>13</sup> Influence of Trop. Climates, pp. 19-23. <sup>14</sup> L'Algérie Médicale, iii : by M. Armand.

I have been able to keep a more or less complete record of meteorological observations at Meean Meer during the year 1885. At such times when absent from the station, on duty, my work was continued by my friend, Mr. Oman, Professor of Physics in the Punjab University, Lahore, to whom I am indebted for much valuable help, and through whom I have been able to obtain access to the meteorological records taken at Lahore. In reference to the unhealthiness of Meean Meer, the following figures taken from the Report of the Sanitary Commissioner with the Government of India for 1884 are worthy of consideration :—

The average daily strength of the European garrison of Meean Meer in 1884 was 832 men. The average daily sick rate per 1,000 of strength was 129·8. The admission rate per 1,000 of strength was 3554, and the mortality per 1,000 was 10·82. This last item was not excessive, it being much below many other stations in India; but the average daily sick rate of 129·8 per 1,000 of strength is, with the three exceptions of Taragash in Ajmere (153·8), Purandhar (144·9), and Chunar (129·9), greater than any other station in India. The admission rate of 3554 per 1,000 of strength is of all the stations throughout India only exceeded by Delhi (4828) and Fort Lahore (3715·4). For the same year the ratio of fever cases per 1,000 of strength places Meean Meer third highest throughout all India. The figures are Delhi, 3979; Fort Lahore, 2423·1; Meean Meer, 2412·3. By reference to Table XXV. of the same report, the total admissions for fever (exclusive of enteric) in Meean Meer is 1,993, or a ratio of 2395 per 1,000 of strength. These figures are only equalled and surpassed by those of Delhi, with a total of 1,894 or 4180 per 1,000 of strength. The figures for 1885 are not yet available, but from what are accessible the sickness of 1885 seems to have been somewhat less than in former years. The return for paroxysmal fevers shows an admission rate of 1187 per 1,000 of strength. Owing to the absence of nearly all the European garrison for about four months of the year, in consequence of the Rawul Pindi, Durbar, in April, and the camp of exercise in October, November, and December, the figures are hardly comparable. Particularly is this so, owing to the smallness of the European garrison in the last quarter of the year, when the malarial fevers prevail the most. This question of the seasonal fluctuation in the prevalence of malarial fevers must first be discussed. The data regarding the varying prevalence of malaria in the cantonment of Meean Meer has been derived partly from the annual returns of the station hospital and partly from the reports of the sanitary commissioner. The annexed diagram No. 1. illustrates the results obtained from these sources, the numbers of cases being expressed in terms of 1,000 per strength. From the diagram it is apparent that malarial fevers prevail the most in the months of August, September, and October. I propose next to inquire into the meteorological and other physical conditions coincident with this prevalence, and endeavour to see, if possible, whether any connexion is traceable between the two series of phenomena. In other words, to determine if there be any series of meteorological and physical constants characterising this season of prevalence. The points to which I have particularly directed my attention are the following :—1. Analysis of soil at Meean Meer. 2. Soil temperature. 3. Sub-soil water level. 4. Carbonic acid in the soil. 5. Atmospheric temperature. 6. Atmospheric pressure. 7. Humidity. 8. Rainfall. 9. Ozonometry. It will be simpler to take these *seriatim*.

1. *The Nature and Analysis of Meean Meer Soil*.—How far the soil is concerned in the production and prevalence of disease has for years past been a moot question. Since the first writings of Dr. Von Pettenkofer, of Munich, the subject has been one of thought amongst medical men in India. Drs. Lewis and Cunningham\* were the pioneers in this country in this particular line of research. In respect to my own inquiries, I was fortunate to have Lahore within easy reach, and thereby to supplement the apparatus available from an ordinary Parke's Chemical Cabinet, with other apparatus from the laboratory of the Chemical Examiner to the Punjab. Meean Meer, situated 4 miles from Lahore, to which it is the military cantonment, is placed in the Punjab plain at a height of 732 feet above sea level. The Punjab itself is a

\* Soil in its relation to disease. Indian Annals, 1876.

part of the great Indo-Gangetic plain. The soil is a sandy alluvium, with a variable intermixture of clay. In the immediate vicinity of Meean Meer the surface soil is a mixture of clay and sand, having a stratum of so-called laterite below it at an average depth of 12 feet. Intermixed here and there is a certain amount of *kunkur*, which really consists of nodular calcareous concretions. According to King\* it is the remains of decomposed shells, and the ultimate precipitation of the carbonate of lime derived from them. This alluvial soil is the debris of the hills brought down by the great Himalayan rivers, and lodged in the great Indo-Gangetic depression. The following schemes showing the strata encountered in digging the foundations of the new institute at Meean Meer, the new Government offices in Lahore, and the new cathedral at Lahore, represent the general nature of the soil in the vicinity.

Institute (M. Meer).    Government Offices (Lahore).    Cathedral (Lahore).

A.		B.		C.	
4'	Sand.	1' 5"	Sand.	3'	Alluvial Sand.
8'	Alluvium with Clay.	7'	Alluvial Sand and Clay.	6'	Sand and Clay.
		5'	Fine Sand.	4'	Sand.
	Clay.		Clay and Sand.		Clay and Sand.

Two complete analysis of soil were made. One in the spring, the other in the autumn. A block of soil was removed from a depth of 5 feet from the surface; the samples were both taken from holes specially dug, the first from European infantry lines, the second from the artillery lines. A mechanical or qualitative analysis on the two occasions gave the following mean result.

Fixed Substances.    Volatile Substances.

Coarse gravel	-	-	3.2	—
Combustible or organic matter	-	-	—	0.00
Fine gravel	-	-	44.3	—
Combustible or organic matter	-	-	—	7.5
Coarse sand	-	-	392.7	—
Combustible or organic matter	-	-	—	14.5
Fine sand	-	-	405.0	—
Combustible or organic matter	-	-	—	16.0
Clay	-	-	106.8	—
Combustible or organic matter	-	-	—	10.0
			952.0	48.0

The *specific gravity* was determined as being 2.9. The per-centage of *air* in the soil was estimated by Pettenkofer's rule, and found to be 42 per cent. The soil is somewhat loose and porous. The question of porosity and permeability is one of some difficulty. The porosity was determined by dividing the apparent S.G. by the real S.G., and calculating for 100 parts. The apparent S.G. or ratio of the weight of a given volume of soil to the same volume of water was found to be 1.7 so that  $2.9 : 1.7 :: 100 : x = 58.6$ . Thus 41.4 per cent. of the soil is occupied by air, a result which corresponds closely with the figure obtained by Pettenkofer's formula.

The capacity of the soil for water was calculated thus: Two filters were placed into the same funnel. Upon the upper filter, 50 grms. of air dried soil were placed. Then cold water drop by drop was added to the soil until it began to trickle down the neck of the funnel. The top of funnel was then covered with a piece of glass, and drops of water gradually added until the soil was completely soaked. After this the filters were taken from the funnel,

\* Geological Survey of India, Vol. IV., p. 380.

and the superfluous drops of water adhering to the papers allowed to run off. The lower filter was now placed into one pan of a balance, and the other with the soil in the opposite scale. Weights were added to the former pan until the balance was adjusted. The wet soil was found to weigh 88 grms. The dry soil was therefore capable of holding 75 per cent. of water. This result was obtained after 41 days of drought, and a mean atmospheric humidity of 42. A similar experiment was made 12 hours after a fall of 1"·25 of rain, upon a sample of soil taken 4 feet from surface. It was found to have a capacity for taking up then 39 per cent. of water.

Chemical or quantitative analyses of the soil were made at the same time as the mechanical or qualitative. The mean of the two analyses is as follows:—

Water	-	-	-	-	-	30·6
Matter insoluble in HCl.	-	-	-	-	-	718·5
Organic matter	-	-	-	-	-	41·3
Silica	-	-	-	-	-	1·5
Alumina	-	-	-	-	-	91·0
Lime	-	-	-	-	-	16·0
Magnesia	-	-	-	-	-	2·0
Iron	-	-	-	-	-	51·0
Sodium chloride	-	-	-	-	-	9·1
Sulphuric acid, chiefly in form of $\text{Fe SO}_4$	-	-	-	-	-	6·0
Phosphoric acid, probably as alkaline phosphates	-	-	-	-	-	1·5
Carbonic acid, combined with lime and magnesia	-	-	-	-	-	7·5
Potash	-	-	-	-	-	20·0
Manganese	-	-	-	-	-	trace.
Loss	-	-	-	-	-	4·0

1000·0

In the foregoing analysis the organic matter was estimated as organic N and  $\text{NH}_4$  by heating with soda lime in a combustion tube. The  $\text{CO}_2$  was calculated by loss of weight suffered on the carbonates being decomposed by sulphuric acid in a Schrötter's apparatus. The remainder of the analysis was conducted thus: 450 grms. of air dried soil were taken and digested with 1,500 c.c. of pure HCl. S.G. 1·15, and the portion insoluble set on one side for further examination. Of this solution 1,000 c.c. were diluted, filtered, and evaporated, with the addition of a little nitric acid at the end to oxidize the iron and organic matter. The dry mass resulting from this process was next moistened with HCl, warmed, and the silica separated and estimated as  $\text{SiO}_2$ . The filtrate remaining was made up by distilled water to 900 c.c. This was divided into three equal parts, *a*, *b*, *c*. From *a* the ferric oxide and alumina were precipitated with sodic carbonate, boiled, and then treated with an excess of sodic acetate, which gave a further precipitate of the iron and alumina as basic acetates. After filtering, washing, and re-dissolving in HCl., it was divided into two parts. From the one, the iron was estimated by the decinormal bi-chromate solution, and the alumina by difference. From the other half the manganese was thrown down by bromine, the lime by ammoniac oxalate, and the magnesia from the lime by hydric di-sodic phosphate. From *b* the sulphuric acid was precipitated by baric chloride, and calculated out as baric sulphate. From *c* the phosphoric acid was determined by precipitation with ammoniac molybdate and calculated out as magnesian pyro-phosphate.

The portion found insoluble in HCl. consisted of quartz, clay, silicates of alumina and iron, and was not further examined. The nitric acid and nitrates were not determined, owing to the breaking of an important part of the apparatus. Nitrates, chiefly of potash, are here and there seen on the surface of the ground, having crystallized out.

The reaction of the soil was taken frequently. Pieces of red and blue litmus paper were placed on soil moistened with distilled water, and covered with a bell-jar. The changes in colour were then observed, and an acid reaction invariably noted. The samples of soil were always taken at a depth of 5 feet. The reaction usually disappeared on exposing the paper to the air for a little time, a fact which is suggestive of much of the acidity being due to  $\text{CO}_2$ . The reaction of soil was also taken on several occasions after ignition, in estimation of volatile matter. The acidity was present then, and due, I

believe, to the presence of sulphates, particularly of alumina and iron, which possess acid reactions. The moisture or *water* in the soil was estimated by difference in weight before and after exposure to a temperature of 212° F.

The results of these analyses throw practically no light on the question of the *nature* of malaria. However, one fact is obvious; from its composition the soil is not a fertile one, a fact which every day experience confirms. This infertility may indirectly be one cause of its malarial properties. The amount of organic matter is not excessive in itself, but yet high, considering the small quantity of vegetation found growing from the soil. As in most soils, iron is present; in this case its quantity is not very high. Sir Randal Martin attributed malaria to the oxidizing influences of the iron in the soil. Precise evidence as to this action is wanting. From the marked acidity present after combustion of organic matter, I think there can be no doubt as to the presence of acid sulphates, particularly of iron and alumina. These are to be considered noxious principles in the soil; noxious not in that they directly produce malaria, but indirectly by their influence in preventing plant life, which life is nature's method of utilizing the organic nitrogen and carbon existing in soils. Another factor present, and militating against vegetable growth, is the large quantity of chloride of sodium found in these samples of soil, namely, .9 per cent. This and the acid sulphates, more particularly the ferric sulphate alone, are sufficient to prevent free plant life, to say nothing of the great absence of moisture. Irrigation, if judiciously and systematically employed, would, in great measure, free the soil of these deleterious substances by the simple process of washing these elements away into the deeper strata. The quantity of lime present, notwithstanding the prevalence of *kunkur* in parts is not large. The excessive dryness of the soil is too another factor in production of sterility. In its present state, the soil contains most of the elements necessary to vegetation *plus* one or two deleterious substances. Moisture is necessary on the one hand to stimulate vegetation, by rendering the inorganic elements of the soil more assimilable, and on the other hand, would further help plant life by mechanically washing away that which is prejudicial to it. The encouragement of *tree* growth would do much to render the soil damper, and more productive, and *pari passu* reduce its malariousness. The lime existing in this soil as *kunkur*, a so-called carbonate, is not a true carbonate of lime, but a salt of lime in a peculiarly insoluble form, and as such, quite useless as the source of lime to plants. The addition of quicklime would, I believe, materially improve this soil, it would act principally in four ways. 1st. By supplying lime which all plants require as part of their food. 2nd. Its chemical action would be a conversion of ferric sulphates into calcic sulphates or gypsum. 3rd. By disposing the vegetable matter of the soil to change into soluble food for plants. 4th. By acting upon the mineral matter of the soil, so as to fit it for entering into the roots of growing plants. In other words, I think we may say that the soil of Meean Meer contains organic matter much in excess of the vegetation growing from it, it further is deficient in assimilable lime, and markedly so in moisture; it also contains an excess of acid sulphates and sodic chloride.

*Soil temperature.*—In regard to this item, no records appear ever to have been taken from this station. The question of soil temperatures is obscure, owing to the difficulties in the way of taking and keeping accurate observations. Since November 1885 observations on soil temperature have been commenced at Lahore Observatory, but are too recent and of too short a duration to be at present available for deduction of inferences. My own observations at Meean Meer were taken consistently throughout the year 1885, and the results embodied in Diagram II. As the purport of the observations was to determine the relation of soil temperature to malarial prevalence both phenomena are shown in the chart. The data concerning soil temperature were obtained in the following manner. In November 1884 I had a hole 10 feet deep and 4 feet wide dug in my compound. It was placed at a spot which at no time of the day is subject to shade, and the surface quite destitute of any vegetation. Thermometers were mounted on wooden blocks and inserted horizontally for a distance of 3 feet into the sides of the pit at the depths of 3, 6, and 10 feet. Their readings were noted at 4 a.m. and 4 p.m. three or four days each week. The hole excavated was always kept covered over with a lid on which earth 2 feet thick was placed. The object of this was to prevent any direct rays of

sun falling upon the sides of the pit, and thereby affecting the thermometers embedded in the earth. Owing to inability to make constant and regular notes of the 10 foot deep thermometer, I have been unable to make a tracing of the mean monthly temperature at that depth. From my notes I find there are two waves in soil temperatures. One an annual, the other a diurnal wave. The annual heat wave is shown in Diagram II. It shows that the mean soil temperature in November, December, January, and February is higher than the mean atmospheric temperature. This agrees in the main with Lewis and Cunningham's observations made in Calcutta. In Diagram II. not only is the curve of soil temperature shown in its relation to the air temperature, but also in relation to the fever curve of the year. On reference to it, it is remarkable that the months of minimum prevalence for fevers are those months when the mean soil temperature is above that of the atmosphere. The fact that the temperatures are so, may be only a coincidence, and probably is without any practical bearing upon the question of malarial prevalence. The diurnal wave appears to vary in degree at different seasons. The depth of soil to which it extends is uncertain, but from my own observations I do not think daily changes are appreciable to any extent below 6 feet. By reference to Diagram III. it will be noted that the greatest range of difference between maximum and minimum temperatures occurs in those months when malarial prevalence is at its least. In the diagram the fever curve has been invested in order to show the relationship between maximum fever prevalence and minimum diurnal changes in soil temperature. In the months of February and March when the fever cases were the fewest the average range between the maximum and minimum temperatures at a depth of 3 feet was from 2·4 to 2·8 degrees, and at a depth of 6 feet the range was from 1·4 to 1·9 degrees, while in September and October when the prevalence of fever is greatest the average range of temperature differed between maximum and minimum only by ·8 to 1 degree at 3 feet deep, and at 6 feet only by ·4 degree. In the colder months the soil seems to rapidly lose heat during the night and early morning. The readings at 4 a.m. differing by 1·5 to 2·5 degrees from those at 4 p.m.; while in July, August, September, and October the daily variation is only ·5 to 1 degree. Another point somewhat remarkable is the increase of heat which I noticed to occur in the deeper layers of the soil after heavy rain. On July 21st, when 1·2 inch of rain had fallen in the night previously, the temperature at 4 o'clock in the afternoon at 6 feet was 94 degrees, the average for that hour being 90 degrees. This temperature continued for the next 36 hours, when it gradually fell. This rise after rain I noticed on other occasions, though to a less degree. It seems to me to be due to either increased chemical action in the soil following moisture, or to diminished evaporation and soil ventilation. Another fact I noticed was this: that on cloudy and close oppressive nights the soil temperature was invariably higher by ·8 to 1·2 degrees than on clear starry evenings. This was probably the result of lessened radiation. The general relation of paroxysmal fever prevalence to soil temperature is well marked in Diagram III., which points to the fact that the malarial phenomena are most active during and just after the period of greatest equal daily soil temperature. The period of minimum variation in soil temperature corresponds with the maximum of malaria. This is a coincidence of some importance, and confirmative of the theory that malaria is dependent upon increased chemical or oxidising processes going on in the soil.

*Sub-soil water level.*—No records as to the level of the sub-soil water in this station appear to have been taken in former years. Observations made weekly, and often bi-weekly, on two disused wells, one in my own compound, and one in a piece of waste *maidan* some 300 yards distant, show that the maximum level of the ground water was obtained in September at a distance of 33·25 feet from the surface. Its lowest level was noted in November and February, when it was at a depth of 35·8 feet. With the exception of the river Ravi, distant 7 miles, there is no large body of water in the neighbourhood capable of exercising any great influence on the ground water. The water supply of the troops garrisoning Meean Meer is derived from the Ravi, from whence it is pumped, filtered, and brought in iron pipes into cantonments. Other than for the European troops the water supply of Meean Meer is derived from wells, the water from which is of a more or less uniform quality. As indirectly

bearing on the question of the etiology of malarial fevers, I append below analyses of water taken from the Ravi just above the pumping station; of some taken from a well in the Sudder Bazaar, and some from a well in the compound adjacent to my own.

Source.	Total Solids, grains per gallon, 1 in 70,000.	Total Hardness.	Permanent Hardness.	Chlorides, chiefly NaCl, 1 in 70,000.	Free Ammonia, 1 in 100,000.	Albuminoid Ammonia, 1 in 100,000.	Remarks.
Ravi-River -	11.7	5.9	2.9	.32	.0028	.0021	—
Sudder Bazaar. }	96.4	8.3	1.4	24.8	.0035	.0163	Much alkaline, sulphates, and carbonates. Nitrates well marked. No nitrites.
Well in Cantonment. }	21.2	11.5	4.8	1.2	.0012	.0023	

My observations on the ground water level were made by means of a float attached to a long chain; this was made to run over a pulley, while to its other end was attached an indicator in connexion with a fixed scale marked on the side of the well cover. It would seem from these records that the greatest range in level was 2.5 feet. The ground water level and fever prevalence appear to have some connexion, namely, an increase in fever cases in the month immediately following a rise in level of the ground water. But when one considers that the range of varying level for the whole year is not more than 2.5 feet, it seems somewhat difficult to understand how so small a fluctuation could affect disease production from the soil. My own impression is that so far as malaria is concerned, the sub-soil water plays no important part. No cholera occurred in Meean Meer during the year; so its relation to that disease could not be judged. As regards enteric fever there does not appear to be any distinctive relationship existing between the two series of phenomena; at least so far as this cantonment was concerned in 1885.

*Carbonic acid of the soil-air.*—The nature of the air in the interstices of the ground is, perhaps, the most difficult of all the questions connected with the soil, on account of the ever varying character of the effluvia derived from the organic constituents in the soil itself. Nichols, Fleck, Fodor, Lewis, and Cunningham have all made observations on this point. Some have found hydrogen sulphide, others ammonia, while all have found carbonic acid. This latter has usually been taken as the index of soil-air impurity. Obvious difficulties exist in the way of obtaining the air for examination in such a state as it exists in the soil itself. And also it is questionable whether the CO<sub>2</sub> can be fairly taken, except under certain conditions, as a measure of the oxidation of, or the chemical changes in, the organic matter of the soil. As Fodor pointed out, all soils have varying degrees of porosity and permeability, and these are factors of importance in the interchange between the air above and the air within the soil. My own work in this matter has been to take samples of air from a depth of 8 feet twice a month, and occasionally oftener. The method I employed was as follows. A pit 9 feet deep was dug, and in the bottom of this large stones, pieces of brick, and broken bottles were thrown for a depth of 1 foot. Into this mass of loose material was embedded a small biscuit tin, in whose sides a number of large openings had been made. To this was attached a small iron pipe, sufficiently long to project 6 inches or so above the ground. The hole was next filled in with its ordinary soil, and the earth thoroughly well battered down. The disturbed soil was allowed to remain six weeks before any observations were taken, in order to allow the soil to recover its usual conditions as much as possible. For the making up of the tube and its construction I am indebted to Mr. Fowler, of the engineers' department in the railway workshops at Lahore. By means of india-rubber



tubing I was next able to connect the tube inserted in the soil with an aspirator capable of holding  $1\frac{1}{2}$  litres of air. This instrument I was able to obtain on hire from Messrs. Evans, Heap, & Co., of Calcutta. The aspirator was again connected and placed between the pipe placed in the soil and a Winchester quart bottle, charged with Baryta solution. The estimation of  $\text{CO}_2$  was conducted as laid down in Parkes' Hygiene. Diagram IV., represents the average amounts of  $\text{CO}_2$  per month in the soil-air at 8 feet. The scale used to mark the amount is the number of volumes of  $\text{CO}_2$  in 1,000 volumes of air. The quantities of hydrogen sulphide, and ammonia were not determined, though their presence was often detected. A careful microscopic examination of the air was made on two occasions, February and August, and a systematic search made with  $\frac{1}{35}$ -inch oil immersion lens for bacteria, and for Kleb's *bacillus malarie*. Beyond some few common forms nothing specific was observed. In the diagram, as the record of  $\text{CO}_2$  is only for 1885, the fever curve is given for the same year, and not the average of five years. It will be noticed that the two curves agree to a great extent with each other. The fever maximum being reached in the month following the maximum of  $\text{CO}_2$  in the soil-air. By a reference to another diagram, No. VII. of the rainfall, it will be seen that the increase of  $\text{CO}_2$  in the ground air is more or less in accordance with the rainfall. The months of November, December, February, and March were the driest in the whole year. Their respective amounts of rainfall being .08 inch, nil, .46, and nil. That is, in December and March no rain fell at all, and in November and February the fall was .08 and .46 inch. The quantity of  $\text{CO}_2$  found in the soil in those months is relatively small. On the other hand, June, July, August, and September were wet months, and are shown to be accompanied by a corresponding increase in the  $\text{CO}_2$  of the soil air. The remaining four months occupy an intermediate position in both cases. The quantity of  $\text{CO}_2$  in the ground air would seem to be dependent upon one or other of two causes, as pointed out by Drs. Lewis and Cunningham. 1. Variation in amount produced. 2. Variation in the amount retained in the soil, by either a lessened or an increased degree of soil ventilation. Lewis and Cunningham\* are disposed to take the second of these two causes as the main factor influencing the quantity of  $\text{CO}_2$  in the soil; and certainly from their figures such would seem to be the case at least in Calcutta, where their observations were made. My own interpretation differs somewhat from that of these observers. They look upon the interference of soil ventilation caused by rain as practically the only factor influencing the quantity of  $\text{CO}_2$  found in the soil-air, and that temperature of the ground has very little to do with it. Whilst admitting and endorsing their views as to the relation which rainfall bears to the quantity of  $\text{CO}_2$  in the soil, I am inclined to think that soil temperature holds a much more important position in reference to  $\text{CO}_2$  present than Drs. Lewis and Cunningham were able to consider from their own inquiries. On comparing Diagram III. with Diagram IV. it is remarkable that the  $\text{CO}_2$  present in the soil increases with the temperature of the ground, and that it was found to be greatest in amount in those two months (August and September) when the range of diurnal soil temperature was the least. That is, it is greatest in amount at the time of maximum soil activity. The probability is that both rainfall and maximum temperature are factors in degree of  $\text{CO}_2$  production. Doubtless, as Lewis and Cunningham have clearly shown, rainfall does interfere with soil ventilation, and by virtue of that action causes an accumulation of  $\text{CO}_2$  in the ground; yet taking Meean Meer soil, and the peculiarly spasmodic and irregular manner in which rain falls here, and how quickly it is absorbed into the ground, it is difficult to see how it could influence the quantity of  $\text{CO}_2$  present purely by virtue of its power of interfering with soil ventilation. The true state of this question is, I think, that maximum soil temperature with a minimum diurnal variation, combined with increased moisture, are the real factors in increasing  $\text{CO}_2$  in soil-air. The  $\text{CO}_2$  so present has no true relation of itself to malaria prevalence, but is merely the index of the chemical activity in the soil, which again is followed in a week or so by increased malarial prevalence.

\* Thirteenth Annual Report. Sanitary Commissioner in India, 1876, p. 162.

*Air temperature.*—In Diagram V. is shown the average temperature at Meean Meer for the past five years, contrasted with a curve of the average prevalence of malarial fevers for a corresponding period. The data for constructing this chart have been obtained from records kept at the station hospital. Embodied in the chart is a third curve, showing the average daily range of temperature from maximum to minimum. The atmospheric temperature alone does not appear to have any relation to the degree of malarial prevalence. The interpolation of the third curve already alluded to is interesting as throwing some light upon a theory or idea which is often given by Anglo-Indians as accounting for the greater prevalence of malaria during the autumn months. I mean the oft-quoted statement that the greater prevalence of malaria in August, September, and October is in consequence of greater diurnal variation in air temperature. A reference to the diagram shows that it is in March, April, May, November, and December that the greatest range of variation in temperature of the air prevails. And it is certainly *not* in those months that malarial prevalence is at its maximum. Whereas in the months of July, August, and September when the variation is lowest the malarial fevers are evincing an increasing degree of prevalence. From these facts it would seem that the popular idea on this head requires considerable modification, if not actual reversal. To make certain of no possible error in constructing this curve I checked the local records of temperature by my own for the year 1885, and by the records taken in past years at Lahore, which were placed at my disposal by Mr. Oman. I found similar results in all; that the maximum of daily variation in temperature does not correspond with the maximum of malarial prevalence as is popularly supposed.

*Atmospheric pressure.*—My own observations alone on this topic are available. The readings of the barometer when corrected for both height and temperature show the extremes of pressure to have been 28·4" and 29·8"; the lowest were noted in June, July, and August, whilst the greatest pressure prevailed in December. There appears to be no indication of any definite relation between degrees of atmospheric pressure and the prevalence of malaria.

*Humidity.*—No data as to previous years being available concerning either the humidity or rainfall at Meean Meer, as in the preceding paragraph, so in this and in the following one, only my own observations on the respective points will be quoted; these relate entirely to 1885. The calculations as to the humidity of the air have been made from the readings of the dry and wet bulb thermometers. Saturation was taken as being 100, and the scale arranged accordingly. The connexion between simple humidity and malaria is not apparent, but when taken in conjunction with temperature of the air there would seem to be some relation. In Diagram VI. the temperature curve of 1885 is shown in relation with humidity. From it, it appears that the malarial phenomena reach their maximum at a period immediately following months of high temperature and high degrees of humidity. When observing the degree of humidity I was often struck with the extremes met with in 24 hours. As an instance, on July 3rd, at 4 a.m., the humidity was 72, while at 4 p.m. the day before it had been only 14. This was no extreme case; on many other occasions it was remarkable the high range of humidity met with. The degree of humidity was always much higher in the night. This, to a great extent, depended upon the state of the barometer and the temperature. A curious fact was noticeable, that the curve of humidity was by no means harmonious with that of the rainfall. This latter is discussed in the following section.

*Rainfall.*—The total rainfall as observed by myself at Meean Meer in 1885 was 19·30 inches. The average rainfall per annum at Lahore, 4 miles away, is 21·63 inches. In June, July, August, and September the rainfall was heavy. The maximum being in July with 7·35 inches. The other months were comparatively rainless. The period of maximum prevalence of fever seems to follow immediately after, but not to correspond exactly with the maximum fall of rain. It will be remembered that a corresponding coincidence was noticed in the quantity of CO<sub>2</sub> in the soil-air. The relation of rain to increased prevalence of malaria is probably dependent upon the action of the addition of moisture to the soil, favouring increased chemical changes. This augmented chemical soil activity making its influence felt by increased fever prevalence

not at once, but in a few weeks following. The relation between rainfall and CO<sub>2</sub> found in the soil-air has been referred to in the paragraph on the CO<sub>2</sub> of the soil.

*Ozonometry.*—Of all meteorological phenomena none occupies such an unsatisfactory position as ozonometry. Some observers deny the existence of ozone normally in the air at all; while others with equal vigour maintain its constant presence. Apart from these discussions, chemical and other difficulties exist as to suitable means of accurately judging of the presence of ozone or not. The usual method is to expose coloured papers (prepared) to the air, and judge of the presence of ozone by the varied tint reactions noted. During 1885 I made a series of observations on ozone at Meean Meer, by means of Schönbein's iodide of starch papers, which I obtained from Messrs. Negretti and Zambra. My method was to expose the papers to atmospheric influences in a box painted black inside and out; and having sides made of perforated zinc, in order to prevent air passing over them with undue rapidity. The papers were examined three times a day, early morning, noon, and 7 p.m. The system of using test papers is unsatisfactory, owing to the difficulty of judging different shades of colour on a chromatic scale. Again, too, these papers seem to undergo chemical changes independent of ozone action. The prepared papers of Schönbein have a scale of from 1 to 10. Considerable difficulty is often found in telling exactly to which scale any given tint is to be referred. In consequence of this fact I am indisposed to attach any great importance to my results. The general effect of my observations is to incline me to think that ozone is more or less always present. One or two facts were conspicuous. Firstly, ozonic reaction was invariably more marked during the night than during the day. Secondly, dust storms and rain were always accompanied by increased reactions of the test papers. What connexion there may be between the presence of ozone and malaria I am not prepared to say. My own observations were too few, and the test papers insufficiently reliable to warrant me in drawing any very precise deductions. From my notes, such as they are, it would seem as if an increase of malaria was synchronous with diminished ozone. I propose continuing my observations with some new papers prepared with iodide of zinc, which is a much more stable salt than iodide of starch. The results obtained I hope to embody in a future and special paper.

*Soil emanation.*—More or less linked with the question of the causes leading to malarial production is the subject of soil emanations. It has been a long credited opinion that such emanations do take place, but when, and of what nature these emanations were has never been satisfactorily demonstrated. As bearing upon this matter the results of some observations of mine may not be without interest. With a view to determine if moisture was ever given off from the soil I made the following experiment: first, I cut out a number of pieces of blotting paper into sizes of 6 inches by 8. Taking two such pieces, they were pasted together with a double fold of gutta-percha tissue between them. The tissue was cut of a much larger size than the blotting paper, sufficiently so to overlap on all sides. Having prepared a number of these, two or more were laid out on bare ground every night; the edges of the gutta-percha tissue being carefully fastened down to the earth by means of weights. The object of the interposed waterproof material was to preclude the possibility of any moisture adhering to one layer of blotting paper passing to that next to it. In consequence of these exposures some very interesting results were obtained. The idea was to see if any moisture ever came from the ground itself, or whether all the moisture such as one finds as *dew*, was the result of deposition from the atmosphere only. From February, when I commenced these observations, to June, the general result was to find the upper layer of paper moist, while the lower one was dry, a fact which indicated deposition of water from the air. Occasionally the lower paper, which being in close contact with the ground and more or less shut out from the air by its waterproof cover, was wet too, but this usually was the exception. Now in the months of June, July, August, September, and October nearly opposite results were obtained. On those occasions the lower paper was always more or less damp, a point which seems to me to be conclusive of the fact that moisture had emanated from the surface of the soil. It is unlikely that it was deposited from any air shut in under the paper, between it and the ground,

as the amount of space between them was too minute. Check observations were made by placing flat pieces of slate and wood on the ground over night. These in the morning were usually found quite damp on their under surface. These results appear to me to be of peculiar interest in connexion with malaria. If moisture thus exudes and emanates from the soil it requires little imagination to understand how deleterious products of the soil, are equally evolved into the atmosphere. I on several occasions expressed the moisture from the blotting paper and exposed it to careful microscopic examination, but failed to find any microtes. In face of these observations, I think there is very little reason to doubt that if hurtful material exist in the soil, organic or otherwise, it is capable of being given off from the soil, either alone or combined with moisture. What these hurtful emanations may be it is less easy to determine.

*General conclusions.*—Having commenced this paper with the intention of determining what relation the physical causes at work in Meean Meer bear to the prevalence of malarial fevers there, it remains now to summarise the inferences capable of being deduced from the data I have been able to collect. There can be very little doubt as to the fact of this station being situated on a malarious site, and by the figures quoted from the report of the Sanitary Commission it is evident that Meean Meer holds a high place in the list of unhealthy cantonments. Analysis of the soil and the sub-soil water fail to reveal any very startling facts sufficient to account for the high sickness rate. Malarial soils are peculiar in existing in no particular part of the world to the exclusion of other parts. The dry soil of the Sahara\* is the home of malaria equally with the damp low-lying coast of Holland, or the Maremma and Campagna of Rome. The somewhat opposite physical characters of soils, producing an identical effect has long been a puzzle to observers. I myself am inclined to think the difference is less difficult of reconciliation than many suppose. Malarious soils may be practically divided into two main kinds. The very dry and barren soils, usually sandy, and the very damp, with luxuriant vegetation, partaking more or less of the nature of a swamp. Organic matter is common to them both, and in each case is found to be considerably in excess of the requirements of the vegetation found on the soil. In estimating the value of the organic matter of a soil, consideration must be paid to what plant and tree life is present in that soil. In the case of the soil specially under consideration, that of Meean Meer, attention has already been made to the fact that what organic matter is present is not turned to the account and purpose which nature primarily intended it to be, viz., the source of plant life by virtue of its nitrogenous properties. No one who has seen the luxuriant vegetation of a tropical or even temperate low-land can fail to realise the vast amount of organic matter which accumulates upon, and decomposing, sinks into the soil in a vicious cycle of seasons as the result of each year's new vegetable growth. The organic matter found in such places is much in excess of even the very free plant life usually found there. Heat and moisture alone are innocuous, but serve as the agents to predispose and start that evil product of the soil, the manifestation of whose presence we find in the paroxysmal fevers. Few doubt that this occult miasma is the cause and exciting agent of malarial fevers. That these fevers can be accounted for by Oldham's *chill* theory, and the predisposition to chill, consequent on extreme daily variation in temperature, is combated by the evidence given in Diagram V. In that chart it is apparent how the greatest range of diurnal temperature is present in May, a month when malarial prevalence is far from being at its maximum. The general results of my observations may be expressed in the following terms. Malarial fevers are at their maximum in Meean Meer in September and October. This period of their greatest prevalence appearing from an examination of the meteorological data to be simultaneous with the termination of—

1. Maximum soil temperature.
2. Minimum daily variation of soil temperature.
3. Maximum rainfall.
4. „ of CO<sub>2</sub> in the soil-air.
5. „ humidity.
6. Minimum amount of ozone in the air.

---

\* Tristram's travels in the Sahara, p. 287.

The sub-soil water level, the barometric pressure, and the air temperature appear from the same data to have little, or if any, only a secondary influence upon malarial production. It is a remarkable fact, and one observable in relation with all of these separate factors, that it is not precisely at the time of their extremes that malaria is most prevalent, but that during the time of their existence there is an ascending scale of prevalence culminating in a maximum at a period immediately succeeding. This fact seems to be suggestive that these various telluric and atmospheric conditions individually are not determinants of malarial activity, but rather that their combination is necessary to, and actually is, the cause of the production of some obscure poison, which for want of a better name we call malaria. The sum of our knowledge regarding the nature of malaria is very limited. We understand it merely as a subtle and unknown agent, a cause of disease known only by its effects, a product of continuous heat and moisture upon vegetable organic matter.

---

The views stated in the foregoing paper as to soil emanations, and the actual deposit of moisture from the ground itself, have received confirmation from the observations made by Mr. Aitken on the "Formation of Dew," as published in "Nature," page 252.

---

DIAGRAM I.

CHART SHEWING BY MEANS OF A CURVE THE NUMBER OF CASES OF MALARIAL FEVER OCCURING EACH MONTH, FROM AN AVERAGE OF 10 YEARS.

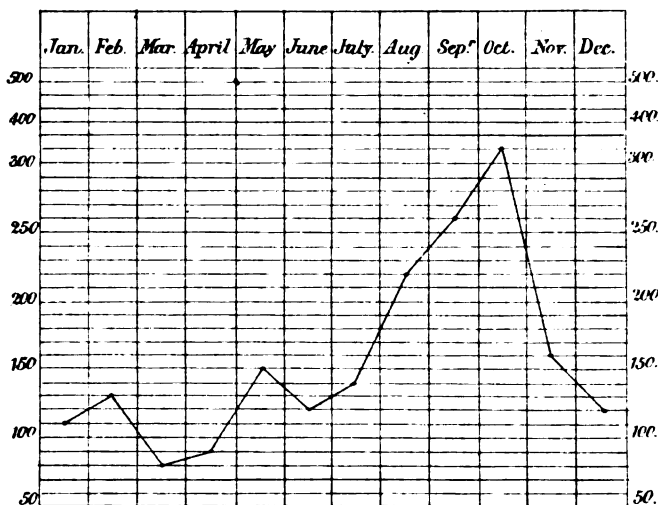
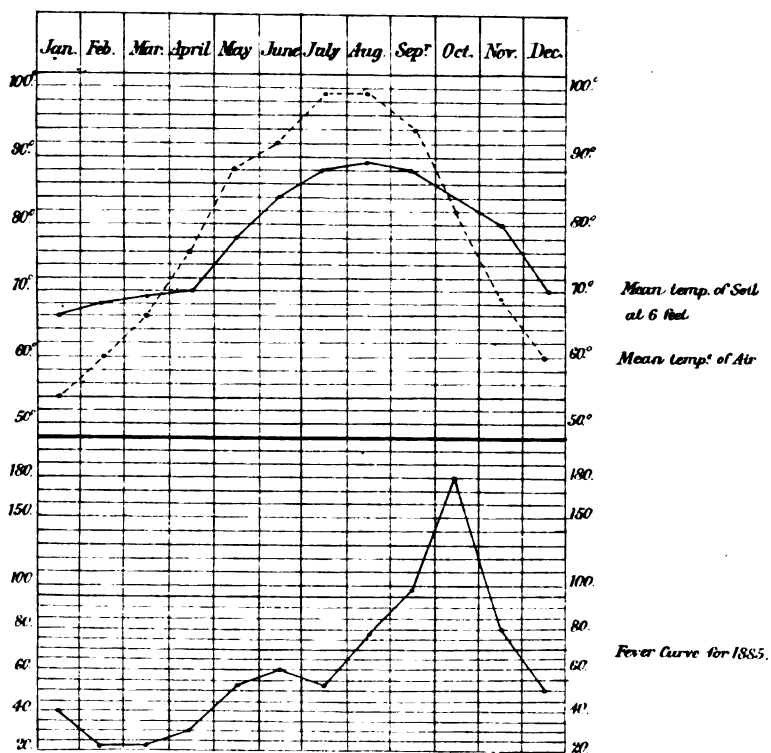


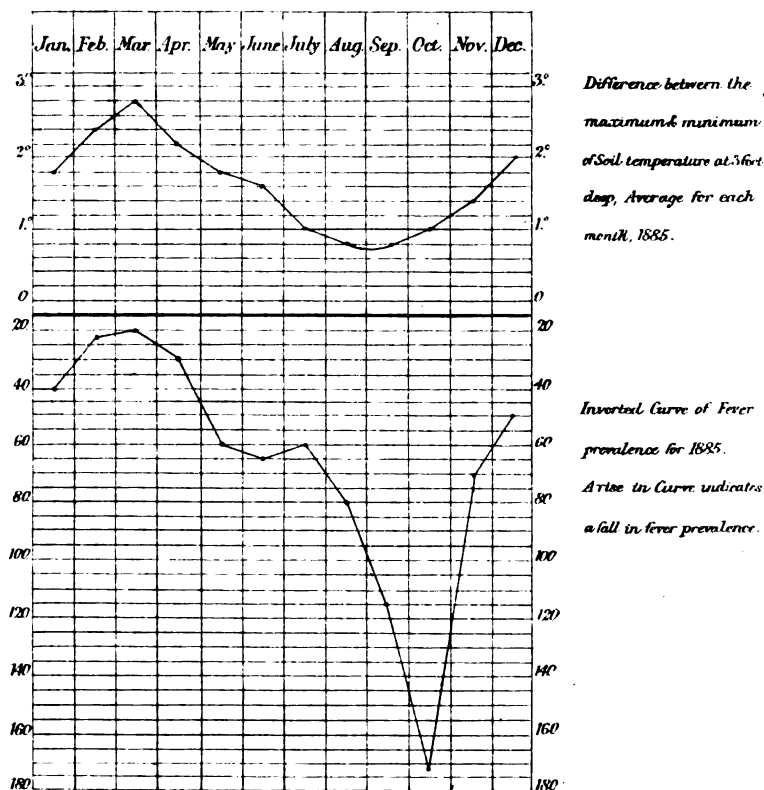
DIAGRAM II.

SHEWING THE RELATION OF THE FEVER CURVE 1885 TO THE CURVES OF MEAN TEMPERATURE OF SOIL AND AIR.

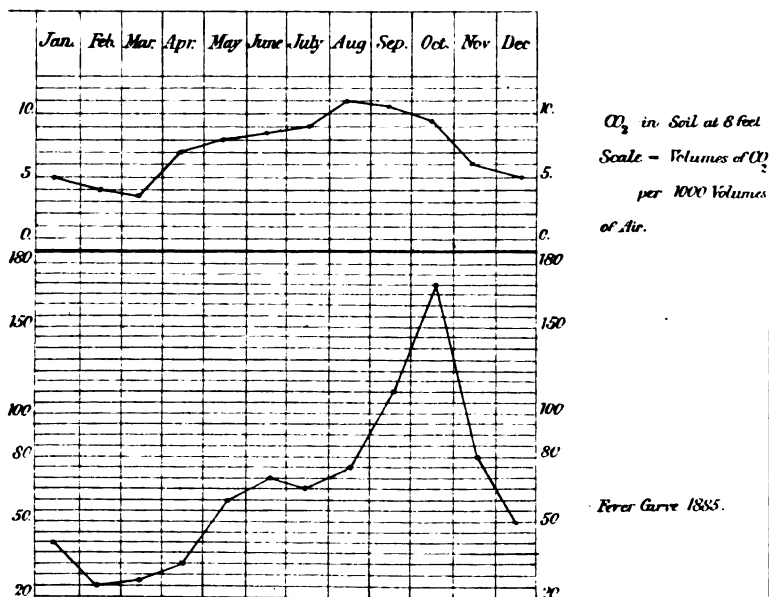




**DIAGRAM III. SHEWING THE RELATION OF THE CURVE OF VARIATION IN SOIL TEMPERATURE TO THAT OF FEVER PREVALENCE, THE FEVER CURVE IS INVERTED: A RISE IN THE CURVE INDICATING A FALL IN FEVER PREVALENCE.**



**DIAGRAM IV. SHEWING THE RELATION OF  $\text{CO}_2$  IN THE SOIL AIR TO MALARIAL PREVALENCE.**



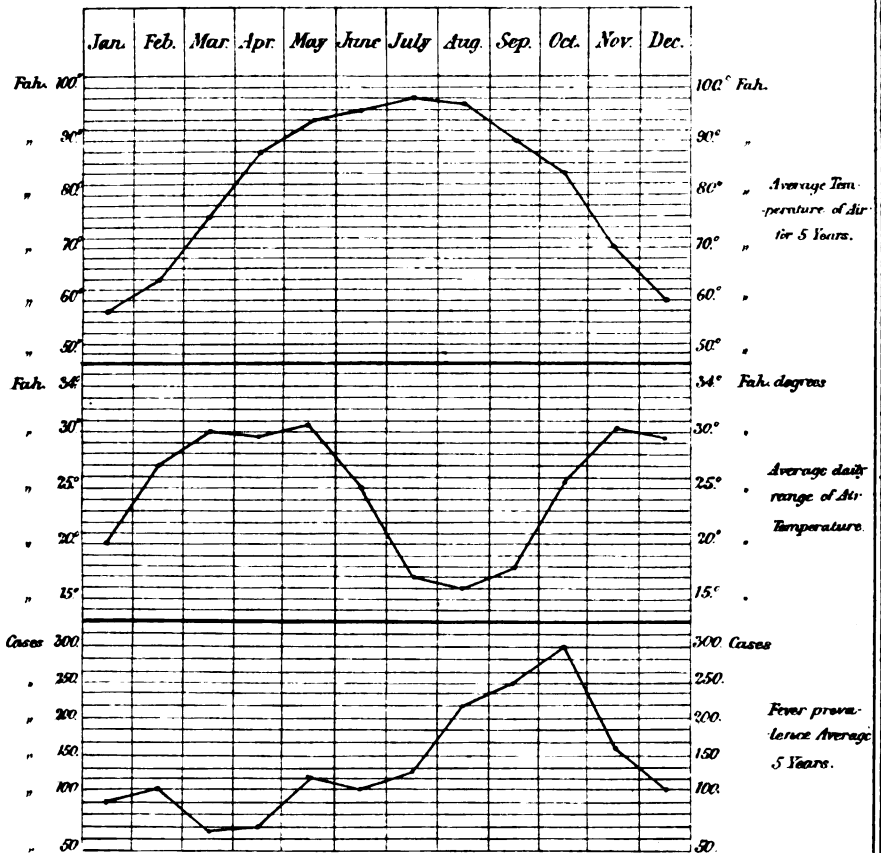




## DIAGRAM V.

SHEWING THE RELATION OF FEVER PREVALENCE  
TO TEMPERATURE OF THE AIR, AND TO DAILY RANGE  
OF TEMPERATURE.

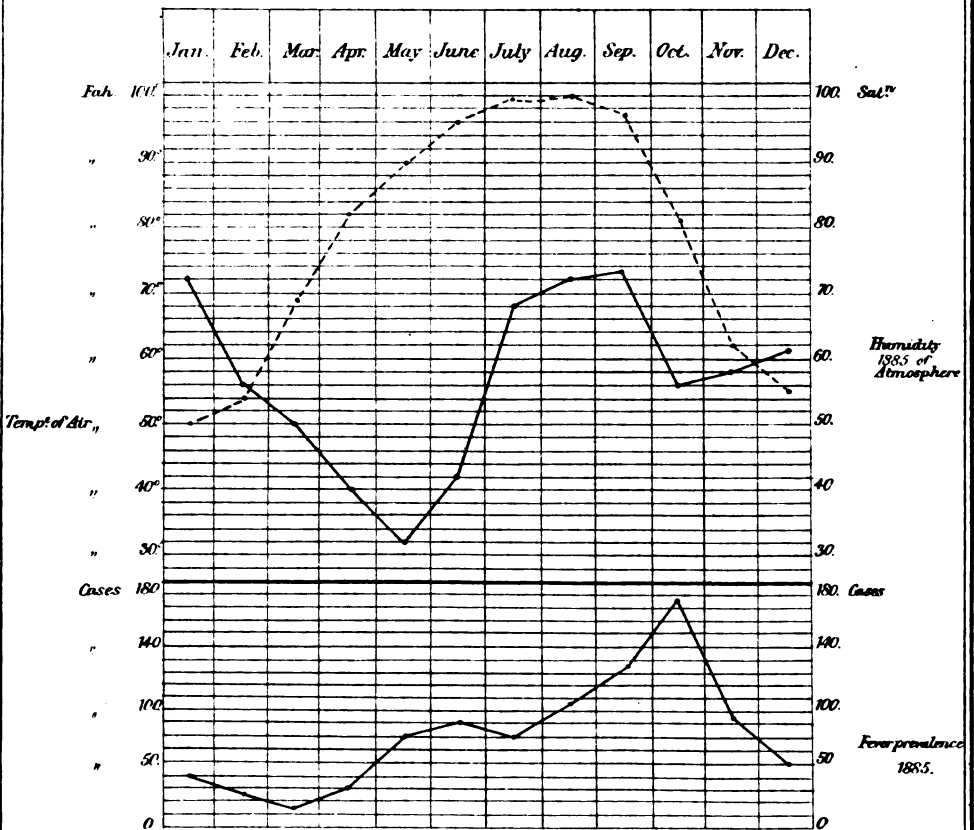
THE CURVES REPRESENT AN AVERAGE OF 5 YEARS:





## DIAGRAM VI.

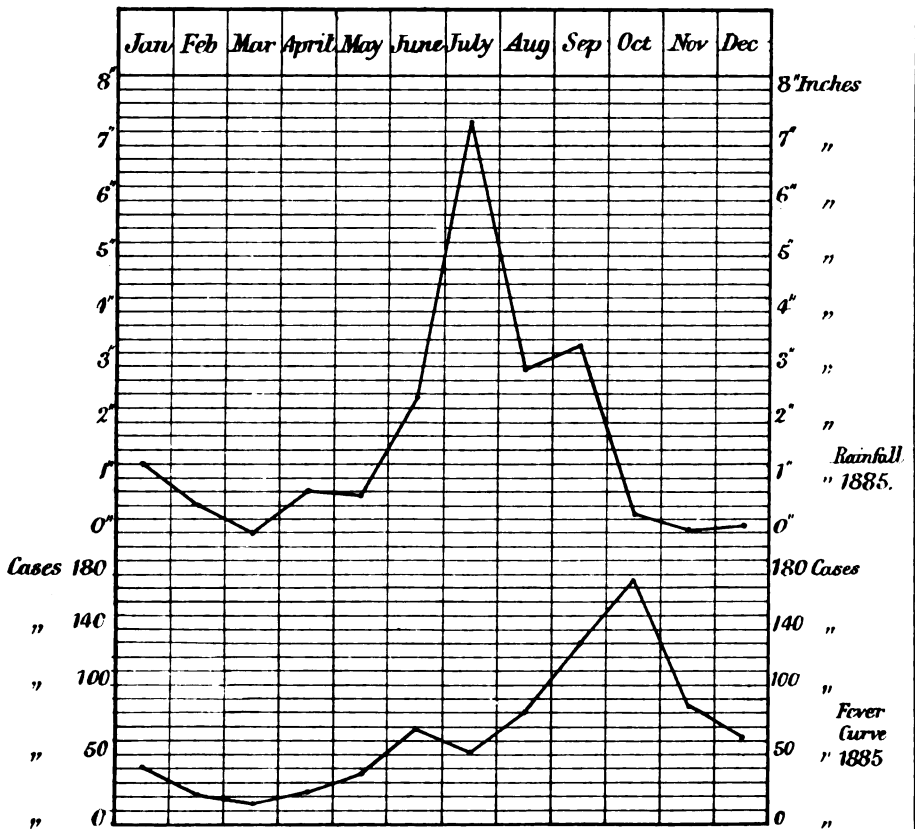
SHewing THE RELATION OF THE FEVER CURVE TO THE  
CURVES OF HUMIDITY AND AIR TEMPERATURE.





# DIAGRAM VII.

SHEWING THE RELATION BETWEEN  
FEVER PREVALENCE AND RAINFALL.





## APPENDIX No. V.

## CASE OF ENTERIC FEVER WITH EXTRAORDINARILY HIGH TEMPERATURE.

By Surgeon-Major G. E. DOBSON, M.A., M.B., F.R.S., Medical Staff.

Private J. K—, Depôt Devonshire Regiment, a recruit, aged 18, of one month's service, was admitted, 29th August 1886, to the Station Hospital, Exeter, complaining of severe pain along the course of the right sciatic nerve, loss of appetite, and general *malaise*.

Ordered a warm bath, a saline purgative, and poppy-head and linseed poultice to the right thigh.

6 p.m. Not much relieved, temperature,  $104^{\circ}$ ; pulse, 86; respiration, 20. To have Dover's powder, 10 grains, at bed-time.

August 30th. 9 a.m. Temperature,  $104^{\circ}4'$ ; pulse, 90; respiration, 20. Face flushed, skin moist, perspiring profusely, very thirsty; ordered cold boiled milk and lemonade alternately, and small doses of diaphoretic mixture every third hour to keep up action of skin. Pain along thigh somewhat relieved.

6.15 p.m. At evening visit found that the temperature had reached the extraordinary height of  $110^{\circ}2'$ . At 5 p.m. it had been  $106^{\circ}$ . Tongue coated with chalky fur and with red edges, body bathed in sweat; pulse, 92; respiration, 20. With this the patient complains little of personal discomfort, says only that he is thirsty, and feels the pain still along back of thigh. In consultation with Surgeon R. T. McGeagh, M.D., M.S., decided that the case was one of enteric fever, and resolved to give quinine in large doses to bring down the temperature. Ordered quinine, 10 grains, to be followed in quarter of an hour by a second similar dose.

9.45 p.m. Temperature  $105^{\circ}$ , a fall of over  $5^{\circ}$  in  $3\frac{1}{2}$  hours. Patient thoroughly cinchonized, skin bathed in sweat; no diarrhoea.

11.10 p.m. Not much change, but easier; inclined to sleep; pulse, 124; respiration, 20.

August 31st. 6 a.m. Slept for four hours from midnight; temperature,  $102^{\circ}8'$ .

9 a.m. Temperature,  $102^{\circ}$ ; pulse, 92; respiration, 18. Lies quite easy, and is perfectly rational, does not complain of pain, skin acting freely. Ordered antim. tart.  $\frac{1}{2}$  grain, every hour to keep up action of skin. Takes his nourishment regularly; no diarrhoea.

5 p.m. Temperature,  $102^{\circ}$ ; same as morning. Stop antim. tart. Skin acting freely. Easy; does not complain of pain. Abdomen slightly tympanitic.

9 p.m. Temperature,  $102^{\circ}6'$ ; pulse, 96; respiration, 18. Rather restless. Ordered Dover's powder, 10 grains, at 11 p.m. Linseed poultice to abdomen.

September 1st. Temperature (9 a.m.),  $103^{\circ}2'$ . Passed an uneasy night; complains much of pain along sciatic nerve; skin still acting freely; no rose spots on abdomen; some gurgling in ileo-cæcal fossa. Pulse, 100; respiration, 20.

11.30 a.m. Temperature,  $105^{\circ}$ . Ordered quinine, 10 grains at once.

1 p.m. Temperature,  $104^{\circ}6'$ . Repeat quinine, 10 grains.

3 p.m. Temperature,  $104^{\circ}$ .

5 p.m. Temperature,  $104^{\circ}6'$ . Repeat quinine, 10 grains.

9 p.m. Temperature,  $103^{\circ}8'$ .

September 2nd. After third dose of quinine given yesterday the temperature came down, and he had a comparatively easy night.



7.30 a.m. Temperature,  $101\cdot6^{\circ}$ . Pain in leg much easier, but general symptoms not so favourable, increasing frequency of respirations and pulse (respiration, 30; pulse, 100); some congestion of bases of both lungs, and hypostatic congestion of integuments of dorsal region, abdomen tympanitic.

5 p.m. Temperature,  $102\cdot4^{\circ}$ . Not much change; pulse, 110; respiration, 28; delirium occasionally.

September 3rd. Temperature,  $102\cdot4^{\circ}$ . No fall since yesterday evening; pulse, 128; respiration, 48; much worse, passed stools in bed this morning while temporarily delirious. Congestion of bases of both lungs increasing. In consultation decided to give port wine to sustain strength, and quinine again should temperature increase.

1 p.m. Temperature,  $103\cdot6^{\circ}$ .

2 p.m. Temperature,  $104\cdot4^{\circ}$ . Ordered quinine, 10 grains, to be repeated in 20 minutes.

3 p.m. Temperature,  $104^{\circ}$ .

4 p.m. Temperature,  $103\cdot8^{\circ}$ . Occasionally delirious; pulse, 140; respiration, 48.

5 p.m. Temperature,  $104\cdot8^{\circ}$ .

6 p.m. Prognosis very bad; pulse, 140; respiration, 60.

10 p.m. Pulse, 130; respiration, 48. Evidently sinking, lungs extensively congested, abdomen very tympanitic.

Died at 7 a.m., 4th September 1886.

Post-mortem examination 10 hours afterwards.

Rigor mortis well marked. The whole dorsal surface of the body hypostatically congested. Extensive hypostatic congestion of both lungs. Heart normal. Pericardium containing a considerable quantity of fluid.

The coats of the small intestine were very much thinned, and numerous ulcers involving both the solitary and agminated glands were found. Some of the ulcers extended through all the coats of the intestine except the peritoneal. There was no perforation. The mesenteric glands connected with the lower part of the ileum were enlarged. The spleen was enlarged and congested. Other internal organs healthy.

The sheath of the right sciatic nerve from its point of exit from the pelvis to a distance of about four inches was markedly congested.

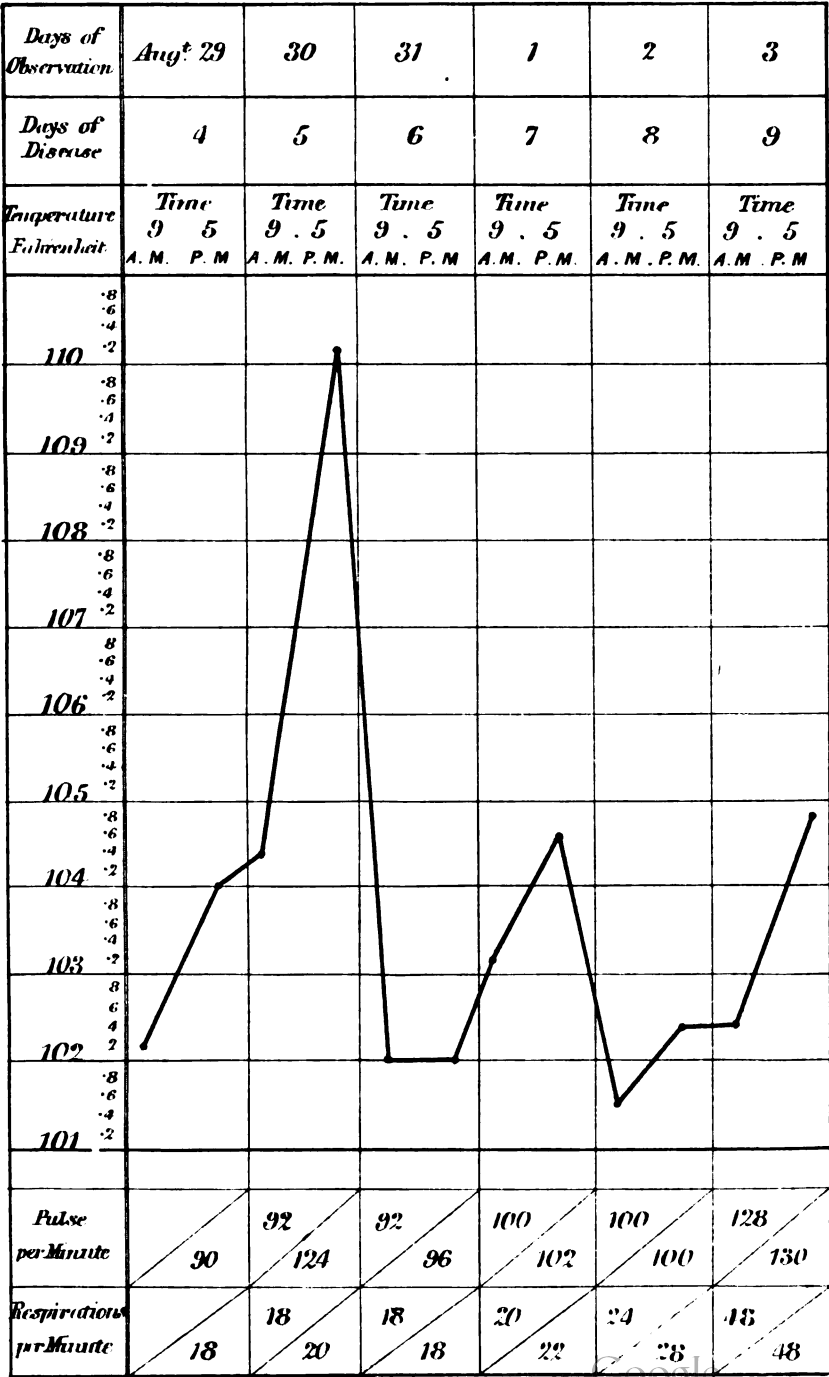
The chief points of interest noticeable in the above case may be briefly tabulated as follows:—

1. The intense pain along the course of the right sciatic nerve complained of by the patient on admission and for some time afterwards.
  2. With this pain an extraordinary rise of temperature to  $110\cdot2^{\circ}$ , reduced by quinine in large doses.
  3. The extensive ulceration of the solitary and agminated glands unattended by diarrhoea.
-

# STATION EXETER. DEPÔT DEVONSHIRE REGT.

CASE OF PRIVATE J. K. ——— DISEASE ENTERIC FEVER

Age 18. Service 1 Month.





## APPENDIX No. VI.

A CASE OF LIVER FLUKE (*FASCIOLA HEPATICA*).

---

By Surgeon W. L. CHESTER, M.B., Medical Staff.

---

No. 1,720, 1st Dorset Regiment, Private W—, age 21 years, arrived in Egypt from England in March 1886.

On being medically inspected he was found to be "unfit" to proceed "up Nile," and was detained at the Nile Reserve Depôt, Ramleh.

On the 12th July he was admitted to station hospital, Ramleh. He was then a weak, delicate, and nervous-looking youth. His symptoms at first were simply febrile; his temperature evening of admission was  $105^{\circ}$ ; during the 48 days he was under treatment his evening temperature varied from  $101^{\circ}$  to  $104^{\circ}$ , morning temperature from normal to  $101^{\circ}$ ; during the last fortnight of the disease the temperature averaged slightly higher than during the earlier period. Pulse was weak and rapid, 120 to 140; respirations, 24 to 32. Bowels were constipated throughout, castor oil and enemata being frequently required. The tongue was generally brown and furred, though from time to time it appeared to clean. He suffered from some bronchitis during the early part of the disease.

The case was looked upon as one of enteric fever, with irregular symptoms.

On the 9th of August he complained of pain in the liver for the first time.

On the 19th the liver was found to be enlarged, but so tender that percussion could not be endured; on the 21st both hepatic and splenic dulness were found to be much increased, liver very tender, and at times extremely painful. He was noticed to be constantly picking at his nose, which he frequently made bleed; he also had nausea, and was several times detected trying to induce vomiting by putting his finger down his throat. He had no rigors. He became very anæmic, and, towards the end, hectic was a prominent symptom. Abscess of the liver, at this period, was suspected.

On the morning of the 29th August there was no change noticeable in his condition. At 2 p.m. he suddenly became collapsed, and was at once seen by the orderly medical officer, who diagnosed the occurrence of internal hæmorrhage. He died at 11.30 p.m. His treatment, generally, consisted of antipyretics, cardiac tonics and stimulants, and counter-irritants to liver.

Post-mortem examination held 12 hours after death.

On opening the abdominal cavity it was found to contain a large quantity of blood. A very large clot of blood was found lying under the right lobe of the liver. There was no peritonitis. The liver was much enlarged, and weighed 5 lbs. 13 oz. A large cavity, about the size of a hen's egg, had ruptured in the base of the right lobe; this was the seat of the hæmorrhage, and inside the cavity a living fluke was discovered.

On making sections of the liver a large number of similar cavities were found, varying in size from a hazel nut to a hen's egg. Some of the smaller of these cavities appeared to be dilated bile ducts with thickened walls, and contained bile, but the larger number contained blood in various conditions. In some the blood was fluid or semi-fluid, and all these contained living flukes. The larger sized cavities were all of this class, except one, in which coagulation of the blood had recently taken place, the fibrine being separated, leaving a portion of the clot white, precisely similar to the clots so frequently found in the ventricles of the heart. No fluke was found in this, or in any of the cavities in which coagulation had taken place. Some of the smaller cavities had organized walls, and contained firm blood clots. In none was there any pus. Over a dozen specimens of living flukes were discovered in the liver, and doubtless there were many more. No entozoa elsewhere.

The spleen was soft and enlarged, weighed 13 oz., was remarkable for its extreme paleness in colour—light pink—perfectly exsanguine. All the other organs were healthy in structure; they were very pale and devoid of blood. The intestinal canal was healthy throughout.

*Description of the parasite.*—The largest specimen measured 1 inch in length and  $\frac{1}{2}$  inch in breadth, quite flat, elongated oval in shape, the head extremity being rather pointed, the other blunt and rounded, margins all round crinkled, colour light grey; at the tip of the head extremity a small orifice, and about  $\frac{1}{4}$  inch from this, in the middle line, on the central surface, a very conspicuous, elevated, circular orifice, which, in the fresh state, appeared to contain a red clot of blood.

*Remarks.*—The parasite is, doubtless, *fasciola hepatica*. In all respects it accurately corresponds to the description of that trematode as given by Cobbold, except that the posterior extremity is much rounder than in the specimen figured by him, but he states elsewhere that this extremity is sometimes rounded.

A case of Chinese liver fluke (*distoma sinense*) recorded by Dr. McConnell (*Treatise on Entozoa*, Cobbold) closely resembles the present case in the symptoms presented during life. The condition of the spleen was also somewhat similar in both cases.

This case, so far as I have been able to study the literature of the subject, appears to be unique, in that the flukes were found in the substance of the liver, and that death was directly caused by their presence.

I have no reason to suppose that this parasite, occurring in the human species, is less rare in Egypt than in other countries.

None of the practitioners in Alexandria to whom I have mentioned the case and shown the specimens, have met with any such in their experience, which is very large.

---

## APPENDIX VII.

## REPORT ON EPIDEMIC CEREBRO-SPINAL FEVER AT DEVON-PORT DURING 1885-6.

By Surgeons J. STEVENSON, M.B., and E. F. SMITH, Medical Staff.

The barracks from which cases of this disease were admitted were the Plymouth Citadel, Millbay, South and North Raglan, New Granby, and Crown Hill Fort. Barracks occupied by troops who were attacked

With the exception of Crown Hill Fort, which is some 3 miles north of the Citadel, all these buildings are in a direction running east and west; the distance of the Citadel from Granby being 2 miles.

The intervening Raglan Barracks are close on the Granby Barracks, and the Millbay about a quarter of a mile west of the Citadel.

The Millbay Barracks, from which the first case came, is situated in Plymouth, and completely surrounded by houses. Millbay.

Raglan Barracks, situated about a mile and a half west of Millbay Barracks, has on its eastern aspect a large barrack square, which is separated from an open space called the "Brickfields" by a glacis and trench. It consists of three blocks, the centre of which is used for office work. Each of the other blocks consist of two wings connected by main body. Raglan.

Out of the seven cases that came from these barracks, three occurred in the north and four in the south block. The first case in the Raglan Barracks occurred in a barrack room containing 16 men. The fifth case was brought from a low lodging-house in Millbay.

In all the barrack rooms ventilation and sanitary arrangements appeared satisfactory.

The latrines, urinals, ashpits, lavatories, &c. are situated in the west and behind the barracks. All were clean and in good sanitary condition; no flaw could be detected in the drains.

The food supplies, which are daily inspected by an officer of the garrison and a medical officer, were sound and wholesome.

Three cases came from the Citadel, which is situated on high ground, having the Hoe to the west, on the east the Barbican and Cattewater, and on the north the town of Plymouth. The citadel is 2 miles east of Raglan Barracks, and three-quarters of a mile east of Millbay. Citadel.

The first case occurred in No. 8 casemate, which appeared well ventilated; the two other cases came from "C" block, which is about 30 yards further north. These barracks are old, but are in fairly good sanitary condition.

Crown Hill Fort, from which a solitary case was sent, is one of a chain of forts surrounding the town. It is about 3 miles north of the Citadel. Nothing insanitary could be discovered in the quarters occupied by the patient. Crown Hill Fort.

Granby Barracks are situated to the north of Raglan, and separated from them by the main thoroughfare between Stoke and Devonport. The one case which occurred here came from a room situated over a disused stable. Granby.

There is no history of any previous attacks of this disease either amongst the naval, military, or civil population in the towns of Plymouth, Stonehouse, or Devonport. The first recognised case of the epidemic occurred on September 17th, 1885, in a boy admitted in the Naval Hospital, Stonehouse, from the training ship "Impregnable," which is anchored 300 yards from the shore in the Hamoaze. On November 29th two more cases were transferred from the training ship "Lion," anchored off the town of Torpoint, about 1½ miles from the "Impregnable." On December 30th a stoker borne on the books of the "Indus" steam reserve was attacked. This ship is grounded alongside of Keyham Dockyard. The case occurred on February 10th, 1886, from H.M.S. "Defiance," which is permanently moored about 200 yards from the shore, at the junction of the St. Germans and Tamar rivers. There was no communication between the men of these ships and the soldiers in barracks.

First cases  
among the troops

On the 20th and 21st January, and 2nd February, three cases were admitted into the Station Hospital, Devonport, from the South Raglan Barracks, which were ultimately diagnosed, "cerebro spinal meningitis;" and on the morning of the 3rd February a man was admitted from the same barracks with very acute symptoms, and died two hours after admission. The post-mortem showed intense meningeal inflammation. It was now suspected that a man who had been admitted under the head of "continued fever" on 12th December, and in whom nervous symptoms ran high, was the subject of the same disease. The diagnosis was changed after admission to "typhus." He died on the 10th instant, and the post-mortem showed the cause of death to have been meningitis.

From this time until April 12th nine more cases occurred; altogether there were 13 admissions, resulting in nine deaths and four recoveries, giving a mortality of 69 per cent.

The following detailed histories are illustrative cases of long and short duration, of death and recovery.

Case of Lance Corporal C——, Royal Irish. Admitted to hospital, 22nd January 1886.

He complained of very severe pain in the head and back of the neck which came on suddenly, although he had been feeling unwell for a week previously. He was moaning and tossing his arms about. Temperature, 100·6; pulse rapid; tongue furred; bowels constipated; at night he was delirious, and had insatiable thirst.

February 1st. All the acute symptoms have disappeared.

February 5th. Complains of pain in head and limbs.

February 7th. Pains in head, back, and limbs.

February 26th. The symptoms have not much changed up to this date, but to-day there is marked trembling of the muscles, and vomiting; the urine is normal. Between this and 4th March he appeared gradually to improve, but on 6th March the quivering of the limbs was more marked and increased when the skin was irritated. Three days afterwards he became delirious, but could be roused at intervals, and then would talk rationally. On the 12th March he was very despondent, and complained of being cold; muscular tremor increased. March 15th, pulse cannot be counted, tongue thickly coated. March 23rd, passed his urine in bed; when conscious he complains of increase of pain in the back of the neck and head; bed sores have begun to form. March 24th. He is very restless; pulse feeble, 114; pupils contracted. March 27th. He appeared very prostrate; there is marked hyperaesthesia of the skin; pupils dilated. Two days after this sordes appeared on the lips and gums, he became drowsy, his motions and urine were passed in bed. On April 1st he became comatose, the extremities cold, respiration shallow and sighing, and he died on April 5th at 6 p.m. The chief symptoms in this case were marked constipation, noisy delirium, at night pain in head and back of neck, slight rise of temperature, pulse very variable, at times rapid and small, and again fast and bounding.

The temperature throughout the case was irregular, rising to 103°, 16 days after admission, then falling to within a degree or two of normal, and so continuing till five weeks afterwards it reached a sub-normal point. It was also irregular in its daily fluctuations. The urine normal in the beginning became turbid and albuminous towards the close.

Post-mortem 39 hours after death:—

Rigor mortis present. Bed sores over the trochanter on each side, and over the sacrum. Slight post-mortem discolouration.

Thorax. Left lung adherent anteriorly and posteriorly to the chest walls. On removing the lung it was found to be congested, weight 16½ ozs. Right lung collapsed, weight, 9 ozs. Bronchial tubes, normal. Heart, 7 ozs., normal.

Abdomen. Liver, 40½ ozs. Gall bladder distended with dark coloured bile.

Right kidney, 5½ ozs., normal.

Left kidney, 3½ ozs. Suprarenal capsules appear large, and firmly adherent to kidney. Spleen, 3 ozs., normal. Stomach and intestines slightly congested, particularly about the ileo-cæcal valve.

**Head.** Congestion of vessels on surface of brain; there is about 2 ozs. of fluid at the base of the brain, the organ weighs  $49\frac{1}{2}$  ozs., its substance appears congested. About 3 drachms of serous effusion were found in the right lateral ventricle, and 2 drachms in the left. The lobes of the cerebellum were united by bands of organised lymph, forming a strong false membrane. The same appearance was noticed on its under surface. The substance of the cerebellum and spinal cord was softened and congested, the membranes markedly congested.

**Case of Private L—, Royal Irish. Admitted March 5th, 1886.**

He was delirious on admission, having been found in a low lodging-house in Plymouth, after five days' absence from barracks.

There is a roseolar rash on the face, but none on the body, the pupils are contracted, he is quite unconscious, and there is bleeding from the nose and mouth. Temperature,  $97\cdot6^{\circ}$ ; pulse,  $90^{\circ}$ . There is no "tâche cérébrale" or hyperaesthesia. Towards evening the eruption disappeared, and the breathing became stertorous. He died at 11 p.m., never having become conscious.

**Post-mortem 24 hours after death:—**

Rigor mortis present and well marked. The dependent parts are much discoloured. Both lungs are much congested; the lower lobe of the left is collapsed, and sinks in water. The heart is healthy, and contains some decolourised clots. Liver, 62 ozs. Kidneys and spleen congested. On removal of the calvarium the membranes of the brain were seen to be intensely congested, the veins being engorged with blood. On the surface of the brain were seen numerous small opacities; at the base about one ounce of serum was found. On slicing the brain the puncta vasculosa appeared to be increased in number, and blood came freely from them. There was under a drachm of serum in each lateral ventricle. The lateral and longitudinal sinuses were full of uncoagulated dark-coloured blood. The cerebellum medulla and pons were congested to the same extent, and when the spinal cord was exposed the inflammation was found to extend down the cord, but in this region the membranes were more congested than the substance of the cord itself. No fluid in the spinal column. The blood throughout the body was "tarry" in character, and did not coagulate firmly.

**Case of Private T—, King's Royal Rifles, aged about 26. Admitted to hospital on 5th March 1886.**

He felt ill on 3rd March, and states a sick feeling came over him quite suddenly. He came to hospital two days afterwards, on 5th March, on which day the pain in the head began. On admission he complained of pain in the chest, head, and back; had slight cough and expectoration; vomited green bilious fluid. There is a large patch of herpes at the right angle of the mouth. At 3 p.m. the patient suddenly became comatose; the pupils are dilated, but respond to light. Temperature, morning,  $103\cdot6^{\circ}$ ; evening,  $102\cdot6^{\circ}$ . The vomiting ceased on 9th March, but the constipation and delirium continued. Three days later a scaly eruption appeared on both elbows, the tongue became thickly coated with white fur, and ptosis appeared. March 16th. He is occasionally sensible, and talks rationally. At night, however, great restlessness supervenes, accompanied with delirium. Ordered calomel and opium every four hours. His nights are sleepless, and the delirium is characterised by muttering and constant attempts to get out of bed. There is quivering of the lips. 19th March. There is general muscular tremor, delirium, stertorous breathing, and hiccough. The following day he appeared easier, took nourishment, and passed a quiet night. He showed signs of consciousness, and the muscular tremor disappeared. Urine passed involuntarily. 29th March. Two scaly patches appeared on the right leg. Constipation continues. He went on gradually to improve from this date, the eruptions dying away, but the drowsiness and inability to contain his water continued. The recovery was slow, and he remained weak both in body and mind for a considerable time. Discharged 10th June 1886. The temperature in this case had no regular or definite course, being  $103\cdot6^{\circ}$  on admission, from which it fell in two days to  $100^{\circ}$ . It did not again rise above  $101\cdot4^{\circ}$  (on the 10th day of the disease), after which it declined, and was sub-normal ( $98\cdot2^{\circ}$ ). On the 13th day lowest temperature recorded ( $97\cdot40^{\circ}$ ).



**Case of Trumpeter H—, Royal Artillery.**

**Onset.**—While on duty on 27th March he was suddenly taken ill, and vomited a quantity of greenish matter. He reported sick, and was admitted to hospital on the following day. When first seen he suffered great agony, and soon became unconscious. He was very restless, the head being much retracted. Temperature,  $101^{\circ}$ . The following day he was conscious in the morning, but soon the delirium returned. During intervals of consciousness he complains of pain on top of the head. On 30th March, the fourth day of the disease, a papular eruption appeared on the right knee; the day following, the tongue, previously coated with white fur having a dark centre, became very hard and dry. He was constipated, and lay on his right side. Urine normal, but loaded with lithrates; passed in bed. Pupils dilated; muscular tremor in right hand. On 1st April the retraction of the head became most marked, opisthotonos was noted, and the respirations were shallow and hurried. A copious red and confluent rash appeared on the right thigh, and a livid red patch over the trochanter, petichial in the centre. Marked congestion of the right lung was now noticed, followed by coldness of the extremities and sinking. He died at 2 p.m. The temperature in this case was  $101^{\circ}$  on admission. It rose to  $101.8^{\circ}$  on the sixth day of the disease, and continued to rise till death, just before which event it reached  $103.6^{\circ}$ . This rise was coincident with the appearance of the pulmonary complication. His diet throughout consisted of fluid food; for example, milk, beef-tea, &c., with stimulants. The treatment was counter-irritation, bromide of potassium, chloral hydrate, and enemata.

**Post-mortem 42 hours after death :—**

Both lungs and the bronchi were much congested, and the same fact was noted of the other abdominal viscera. Heart healthy; the pericardium contained 3 ozs. of serous fluid. The mucous membrane of the stomach and ileo-cæcal valve were also redder than normal. The vessels of the membranes of the brain and cord were very full, and the dura mater adherent over the superior longitudinal sinus. The exudation of lymph was most abundant along the track of the vessels, and appeared in some places to resemble healthy pus. The brain substance was very vascular, and there was about 3 ozs. of fluid in each lateral ventricle, and a symmetrical circular deposit of lymph over the 4th ventricle.

After a careful investigation into every sanitary condition under which the patients had been living, nothing was noted which was likely to have produced the disease. The cases were admitted from all the barracks occupied by the troops stationed here, and no fault could be found in the nature of the duties. The conditions of food and residence having been common to very many other men. The provisions supplied to the troops in this town are of exceptionally good quality, and no complaint was ever made regarding the bread.

The following synopsis of symptoms, &c. of eight cases drawn up by Honorary Brigade Surgeon Baker at the time they occurred being considered highly descriptive is here reproduced :—

**SYNOPSIS** of the **SYMPTOMS**, &c. of eight cases of cerebro-spinal fever admitted into the Station Hospital at Devonport in the winter and spring of 1886.

Invasion.

Sudden in most of the cases, if not all, with invariably severe nervous shock, vomiting of greenish or yellowish matter. Excessive pain referred to the head and back of the neck. Spasmodic contraction of the muscles and purpuric eruption.

Temperature.

The highest and lowest in these cases were  $105.8$  and  $96^{\circ}$ . Liable to very sudden changes without any apparent cause; the morning being frequently higher than the evening. A remarkably low temperature in some cases even when death was not very near at hand.

Pulse.

Subject to great and rapid changes without apparent cause, being at one time as low as 54, regular and full, and at another 160 jerking, feeble, small, and in some cases dicrotic.

Stools.

Constipated. No diarrhoea in any case. Passed involuntarily in some of the worst cases very early and in somewhat milder forms about the end of the third week.

Urine.

Examined in all men except three, two of whom died in a few hours

Apparently healthy and no albumen found in it. Frequently passed involuntarily after the first 10 days.

Seen in two thirds of these cases chiefly on the face and upper extremities, appearing early in many. First of a dark red but soon becoming purpuric. Herpes, roseola, urticaria, psoriasis have been seen, and in some cases two kinds on the same person. In certain patients it has disappeared and subsequently re-appeared. Tâche cérébrale in several cases.

Insatiable in more than half these men.

Existing in all and most marked in many, amounting in many to well developed opisthotonos.

Ptoxis observed in one case but no paralysis of the extremities.

Yellowish or greenish, in several cases very early in the disease, but when occurring later, of mucus and sometimes like coffee grounds.

In bad cases pupils much contracted or dilated and insensible to light, inflammation seen in one case. Photophobia in some.

Less coated and dry than in most continued fevers, and subject to extremely rapid changes either for the worse or better. Seldom brown or dry for many days in succession, but generally becoming so towards the close of fatal cases of more than a few days' duration.

Seen in several, more especially towards the end of a prolonged case.

Very marked in about one third of the cases, and in some throughout, when it is usually accompanied with tremulous movement of the muscles.

Dull and stupid generally, but sometimes terrified.

Usually on the side, except when very ill or approaching death, when it becomes dorsal.

Generally take nourishment well, but liable to great and sudden changes.

Existed sooner or later in every case, but like almost all other bad symptoms subject to sudden removal or accession, often violent and noisy.

Most intense in all cases in the head and back of the neck, and some complain of the back and limbs.

In one case, and that of the knee only.

In four cases from the nose.

In several and when complete, stertorous breathing.

Not seen in any case.

This Report contains but few facts which have not been already recorded regarding this mysterious disease, and throws no light on the etiology. It, indeed, seems impossible from the various conditions attending the epidemic to venture any plausible theory of its causation.

It could not be ascribed to sanitary defects as none were applicable, and as only 13 cases occurred in four months out of a strength of about 2,400 men occupying six different barracks, nearly all widely apart, it is not probable, unless it could be traced to the food and drink, which it was not, that the same insanitary cause existed in all these barracks at this particular time. Moreover, of the women and children who are most susceptible to insanitary influences none suffered. At the same time there should be admitted a difficulty in assigning the morbid conditions which characterise the disease to any but a specific cause and, in this instance, apparently fostered by low temperature, the outbreak having appeared with setting in of cold east winds and disappeared with rise of temperature and change of wind. But the question arises why were not the civil population also attacked? We met with no circumstances leading to the belief that the disease is infectious or in any way communicable to the healthy. It is notable that the first case was in a man 43 years of age, and that another had attained the age of 38. These two instances, however, do not alter the received opinion that it is essentially a disease of young people. Of treatment it cannot be said that any remedies were eminently useful. Symptoms had to be combatted. Ice to the head and sedatives were almost invariably beneficial, while purgatives were always required at first.

Local bleeding in some cases did much good, but in many it was not admissible; counter-irritation also seemed beneficial.

When recovery took place it was complete, leaving no paralysis or other nerve defect.

Eruptions.

Thirst.  
Spasmodic contraction of muscles.  
Paralysis.

Vomit.

Eyes.

Tongue.

Sordes.

Hyperæsthesia.

Expression.

Decubitus.

Appetite.

Delirium.

Pain.

Inflammation of joints.  
Hæmorrhage.  
Coma.  
Gangrene.

Remarks.

The sequence of admissions, barracks, and other points bearing on the epidemic are shown in the following table :—

Date of Admission.	Regt. No.	Rank.	Regiment.	Age	* Service in years.	Habits.	Barracks in which located.	How employed a week prior to admission.	Average minimum temperature.	Barometre Pressure.	Direction of wind which was prevailing.	Remarks.
13/12/85	49	Private	Royal Irish	43	5	Temperate	Millbay	Guards, picquets	40°	30.4	E. & E.N.E.	
20/1/86	26	L.-Corpl.	"	20	3	Temperate	South Raglan	"	24°	29.4	W. & S.W.	
21/1/86	188	Private	"	26	11	Addicted to drink ; latterly temperate.	"	"	20.8°	29.4	N.E.	
3/2/86	2,044	Private	"	18	1	Temperate	"	Recruit drill	32.2°	30.6	W. & N.W.	
9/2/86	51,454	Gunner	R. Artillery	19	3 1/2	Very temperate and regular. Drinks, but never intemperate. Total 1 month before admission.	No. 8 Casemate Citadel. North Raglan	"	40°	30.3	E. & N.E.	
22/2/86	1,501	Private	K. R. Rifles	38	18 1/2	Temperate	South Raglan	Garrison boat's crew 18 months ; no other duties.	29°	30.1	E.N.E.	
5/3/86	471	Private	Royal Irish	23	3	Drinks, but not intemperate.	"	Had been absent 5 days prior to admission ; found in a house in Millbay, Feb. 26th fatigue, March 3rd guard, 4th fatigue.	26°	30.1	N.E.	
5/3/86	528	Private	K. R. Rifles	26	3	Drinks, but never intemperate. Sober and steady	North Raglan	"	26°	30.3	E.N.E.	
13/3/86	1,714	L.-Corpl.	"	21	2	Drinks, but never intemperate. Sober and steady	"	Signalling	27.8°	30.3	E.N.E.	
22/3/86	762	Private	3rd Devon Art. Mil.	18	1st training. 2 1/2	Very temperate and regular.	Crown Hill Fort. "C" Block, Citadel.	Recruit drill 4 1/2 hours daily. Duty every other day as trumpeter.	47°	29.3	E.	
28/3/86	37,983	Trumpeter	R. Artillery	19	1 1/2	Temperate and regular.	"C" Block, Citadel.	Ordinary drill	47.2°	29.8	S.W.	
5/4/86	53,143	Gunner	"	20	1 1/2	Very temperate and regular.	No. 1 B Block, Granby Bks.	Duty as trumpeter, no guards or exposure.	43.2°	29.9	W.S.W.	
12/4/86	41,474	Trumpeter	"	17	2	Very temperate and regular.	"	"	35.5°	30.08	E.	

## APPENDIX VIII.

ON THE OCCURRENCE OF JAUNDICE, ICTERIC URINE, AND  
HÆMATINURIA IN REMITTENT FEVER.

By Surgeon R. H. FIRTH, F.R.C.S. England, Medical Staff.

Within the past year it has been my privilege to have seen two cases of remittent fever, complicated with jaundice, icteric urine, and hæmatinuria. It will, I think, be conceded that few subjects have caused more discussion or a greater divergence of opinion among physiologists and pathologists than jaundice. Perhaps hardly second to this, in respect to its voluminous literature and the diverse opinions as to its pathology, comes malaria. To the army surgeon, who sees more of malarial fevers than any other section of the medical profession, the subject of the paroxysmal fevers, however approached, must be of surpassing interest and importance. To all who have seen much of malarial fevers, instances of co-existing jaundice and hæmatinuria must be familiar. The occurrence, however, of jaundice, icteric urine, and hæmatinuria, cannot be considered altogether common clinical phenomena in these fevers. Out of 1,033 cases of *intermittent* fever, I find 26 to have been accompanied by jaundice simply, that is 2·5 per cent., none with icteric urine, and only 11 with hæmatinuria, or about 1 per cent. These are all cases drawn from India. Cases of apyrexial hæmatinuria occur in England, which are generally held to be of malarious origin; these, for the purposes of my paper, I have not included.

By the courtesy of various medical officers serving in India I have been able to get reliable information as to 221 cases of true *remittent* fever. Of these, including my own two cases, I find 4 had well-marked jaundice alone; 2 had jaundice, together with hæmatinuria; and 2 had jaundice, hæmatinuria, and icteric urine.

Both of these last two cases died. Jaundice, hepatic tenderness, hypercholia, and vomiting of yellowish-green fluid, seem to have been common to all these eight cases. In the two fatal cases there seems to have been a tendency to suppression of urine, together with icteric and hæmatinuous urine. My own two cases may be thus briefly described. The first was under my care in the Station Hospital at Mian Mir during the hot season of 1885. The patient, a young soldier, had remittent fever of a severe type. The fever ran high, marked by irregular and short remissions. There was hepatic tenderness and enlargement, hypercholia of alvine discharges, vomiting of biliary fluid, and well-marked jaundice; the appearance of this latter symptom was followed on next day by dark smoke-coloured urine, which contained casts of bile-pigment, and gave the biliary re-action in response to Gmelin's and to Pettenkofer's tests. The urine until two days before death quite failed to give evidence of albumin; it contained a few blood corpuscles, but with the spectroscope and with guaiacum and ether showed the extensive presence of blood pigment. The subsequent post-mortem on the patient revealed no marked organic changes in the liver nor any obstruction of the bile ducts. The alvine discharges during life were markedly bilious. The second case I saw at Amritsar in the autumn of 1885. The patient had remittent fever of a severe kind; irregular and short remissions, jaundice, hypercholia, vomiting of bright yellow viscid fluid, and hæmatinuous but not icteric urine. The urine in this case was at no time albuminous, but the spectroscope and guaiacum with ether demonstrated the presence of the colouring matter of blood. This patient eventually recovered.

His urine at no time responded to Gmelin's or Pettenkofer's test for bile or biliary colouring matter. The occurrence of these symptoms, jaundice with

icteric and hæmatinous urine, is, I think, of great interest, as bearing on some recent researches on the blood in the malarial cachexiæ. Before entering upon the probable explanation of these clinical facts it will be better to refer briefly to the general pathology of jaundice.

Cases of icterus may be grouped primarily into two classes:—1. Cases in which there is mechanical impediment to the flow of bile into the duodenum. The bile being thereby retained in the biliary passages is thence re-absorbed. 2. A commoner class of cases in which *no* such impediment exists.

The cases included in Class 1 are usually sufficiently clear in their clinical aspects, and cannot well be mistaken for the jaundice of remittent fever. In them, too, after death, and in animals also in whom the bile duct has been ligatured, the lymphatics of the liver are found to be full of bile, a pathological condition not usual in post-mortems upon remittent fever cases.

The jaundice of remittents belongs to the second of the two classes. We may ask, What, then, is the cause of the jaundice in this class in which *no* impediment exists to the outflow of bile? Boërhave and Morgagnin made a suggestion that the jaundice might be due to a suspended secretion of bile from the blood by the liver. In England this explanation has found considerable favour, more particularly by Budd. He, however, was careful to exclude from this hypothesis the bile acids, which he does not admit come from the blood at all, but rather are formed in the liver itself. Dr. G. Harley, in his work, adopts a similar view.

This explanation, though plausible, has some objections. Although bile-pigment seems at first sight to be secreted from the blood, yet it has not been at all satisfactorily proved that bile-pigment exists as such in the blood of a healthy individual.

Frerichs denies that these pigments ever exist in the blood. He is supported by Lehmann, who failed to find bile-pigment in the portal vein or in the hepatic artery. Another difficulty is this: that the bile-pigment daily excreted in the bile is so much that it could not all be derived from the blood. There are objections to thinking it to have two origins, part from the blood and part from the liver. Another difficulty is that jaundice fails to occur on extirpation of the liver, which, if the pigmentary constituents of the bile do come from the blood, it should do, just as the accumulation of urea occurs after removal of the kidneys. This experiment has been tried by Moleschott, Müller, Kunde, and Lehmann, who all failed to find bile in the blood, urine, or muscles of frogs after hepatic extirpation. Lastly, in cases in which the liver becomes destroyed and no bile secreted, yet jaundice fails to occur. If the bile-pigment exist in the blood, where does it go in these cases? We are forced, then, to imagine in these cases of Class 2 that the cause of the jaundice is something more than a mere suppression of hepatic function. Frerichs tries to meet this difficulty by proposing that the colourless bile-acids, found in the liver, are either derived from the blood in the portal vein or are absorbed from the bowels. In health, he says, these get oxydised in the liver, and go to form taurin and the urine-pigments. But that in diseased states the bile-acids do not get so oxydised, but are turned into bile-pigments in the blood, and by its medium circulate generally, leading to the production of symptoms of jaundice. His views receive corroboration from the two following experiments:—

A.—Bile-pigment can be made from bile-acids by treatment with sulphuric acid.

B.—The injection of colourless bile-acids into the veins of a dog produce bile-pigments in the urine.

Another point to be noted is, that experiments upon the lower animals and on man show that from 35 to 40 ounces of bile are daily secreted.

Of this quantity only a fraction leaves the bowel as altered bile-acids in the alvine evacuations (Gangee).

What becomes of the rest? It is probably absorbed from the bowels for various purposes in digestion, and subsequently oxydised in the blood into urine pigment. I myself have often noted how large doses of calomel increase not only the bile-pigment, but also the urine pigments.\* The bile and urine

\* Firth on "Calomel as a Chologogue."—Journal of Physiology, 1880.

pigments are in their composition closely allied to each other. Urobilin, a biliary pigment, occurs in the urine of fevers generally, and has been found in cases of extensive extravasation of blood.\* It is highly probable that a large part of the bile not discharged in the fæces is again absorbed by the mucous membranes of the bowel and biliary passages. The constant secretion and absorption of bile is, in fact, a part of the osmotic circulation, which is constantly going on between the fluid contents of the bowels and the blood. It would seem that in health the whole of the bile which is absorbed is at once transformed, so that neither bile-acids nor bile-pigments are found in the blood or urine.

Under these conditions of health there is no jaundice. But on the other hand, if this metamorphosis fail to take place, as in disease, then these pigments circulate in the blood and stain the skin and tissues.

I believe that it is in this we have the key-note to the explanation of malarial jaundice, icteric urine, and hæmatinuria. It will be remembered that of the eight cases referred to in the beginning of this paper some had jaundice simply, others had jaundice plus hæmatinuria, while two others had not only jaundice and hæmatinuria, but icteric urine also.

By applying the explanation given above on the pathology of jaundice generally, it is not difficult to account for the occurrence of a jaundice with hæmatinous and icteric urine in remittents on a hæmo-hepatogenous theory, with the supposition of an oxidation in the blood of certain pigmentary materials, primarily intended for the bile, but which have failed to undergo the normal physiological metabolism. But in the cases in which there existed a jaundice, but a *non-icteric* urine, a difficulty arises. How comes it that pigment could exist sufficiently in quantity to stain the cutaneous tissues (jaundice), but yet fail to cause the urine to respond to Gmelin's and Pettenkofer's tests? Does the hæmoglobin of the red corpuscle escape out of the blood vessel into the tissues and there undergo changes leading to discolouration? If so, then, possibly only a small amount gets carried to the kidneys and insufficient to cause changes in urinary pigmentation. Probably when this liberated colouring matter is only small in quantity, it, for the most part, escapes from the blood vessels into the tissues by means of wandering leucocytes; but if the disintegration of the red corpuscle is greater, and a proportionately larger amount of pigment set free, then a larger quantity passes through the kidneys, sufficient to give rise to hæmatinuria and icteric urine.

It is probable that under certain circumstances icteric pigment is formed in other tissues besides the liver, and, moreover, may be so extensively formed as to lead to a general icteric discolouration or jaundice.† Or, to put it into other words, the discolouration is produced in a similar way to that following extravasations of blood and bruises. This has been termed by some as an "inogenous" jaundice as distinguished from a true hepatogenous variety. This, when viewed in conjunction with recent researches of Klebs, Tommasi Crudelli,§ Marchiafava, and Celli‡ offers an explanation as to an icterus with or without icteric and hæmatinic urine occurring in remittent and other malarial fevers. Marchiafava and Celli|| have demonstrated that in the paludal fevers, an organism exists which has its special habitat in the red corpuscle. In this it develops, and leaves the corpuscle when it has reached a perfect stage of development. During an attack of fever many corpuscles are seen to have in their interior one to eight minute bodies. The corpuscle itself, which at first is free from black or hyaline substance, is of normal shape and elasticity. The development of this parasitical body gradually proceeds. *Pari passu*, the red corpuscle disintegrates. The hæmoglobin gradually becomes converted into black pigment, which is set free on the breaking up of the corpuscle. The pigment is then found to be either swimming in the plasma or swallowed by and imbedded in a white corpuscle. The exact nature of this body seen in the red corpuscle is as yet not precisely determined.¶ This much is certain, that under its influence the red corpuscle is seen to undergo changes and sub-

\* Landoz's and Stirling's Physiology, page 542.

† Virchow's Archiv., Vol. XCV., page 125.

‡ Memoire del Lincei. 1883.

§ Academi del Lincei. Vol. IV., Serie 3<sup>a</sup>. 1879.

|| Op cit.

¶ Ind. Med. Gazette, January 1886.

sequent disintegration. The escape of the hæmoglobin from the red corpuscle into the plasma supplies the necessary requirement for the production of an "inogenous" jaundice, icteric urine, and a hæmatinuria. These pathological changes in malarial blood can be demonstrated by treatment with an aqueous or alcoholic solution of methyl blue and the preparation completed by the method of Koch and Ehrlich. It would seem that many of the other phenomena of remittent fever, the masked anæmia, the action of quinine, and the persistence of infection, are the outcome of the hæmoglobinæmia resulting from the presence of a parasite in the blood of those suffering from malaria.\*

Summarising, we may say that—

- (1.) Hæmatinuria alone is not uncommon in the intermittents; that jaundice occurs in the remittents not infrequently, and often accompanied not only by hæmatinic, but by icteric urine.
- (2.) That in health whatever bile fails to pass out of the alvine discharges undergoes a re-absorption and transformation; but that in non-malarial jaundice, independent of occlusion of the biliary ducts, such metabolism of re-absorbed bile fails to take place, resulting in the circulation of, and a deposition of, pathological pigmentary material, i.e., icterus.
- (3.) That in malarial fevers this failure of the metamorphosis of re-absorbed bile-pigment is not essential to, or the only cause of the production of, a jaundice; nor is it adequate to account for those cases in which a severe jaundice exists without any evidence of biliary pigment in the urine. The missing link in the chain for the production of malarial jaundice, and a corresponding pathological urinary pigmentation, is supplied by the definite discovery of an actual disintegration of the red blood cells, followed by the liberation of their contained hæmoglobin, which latter can be traced as escaping either in the plasma or in the body of some leucocyte into the main current of the blood and into the tissues; there it undergoes modification, resulting eventually in definite pathologico-cutaneous and pathologico-urinary pigmentary changes.

Finally, I would draw these conclusions:—

- (a.) Hæmatinuria occurring alone in an intermittent fever need not be regarded as a grave symptom *per se* (an apyrexial hæmatinuria is common in Europe), though it is a clear sign of blood-corpuscular disintegration.
- (b.) Jaundice alone, or accompanied by hæmatinuria, occurring in a case of remittent fever, must be looked upon as a grave symptom, and as indicating intensity of malarial action upon the coloured elements of the blood.
- (c.) The occurrence of an icteric urine, combined with jaundice and hæmatinuria in remittent fever, must be ever regarded as an index of *most intense* disintegration of the red blood cells. It calls for a correspondingly grave prognosis to be given as to the termination of such cases.

---

\* Lancet, June 17th, 1882 and August 1885.

## APPENDIX No. IX.

REPORT ON A CASE OF INFLAMMATION OF THE  
CONNECTIVE TISSUE.

By Surgeon-Major H. F. L. MELLADEW, M.D., Royal Horse Guards.

James C., a trooper in the Royal Horse Guards, was admitted into the regimental hospital at Regent's Park Barracks on 1st November 1886, with a view to the removal of a fibrous tumour situated over the right hip. Aged 30, with 11 years' service. He was a very spare man, who had had syphilis, although not lately, several times. As on admission the man looked ill and out of health the intention was to improve this before operating.

On the evening of November 24, 1886, patient complained of a general cold and sore throat; the tonsils were slightly congested, the tongue furred, the skin dry, but with only a slight increase of temperature. Cathartic pills were given, followed by a diaphoretic. Patient passed a restless night, the febrile symptoms increasing rapidly, the thermometer registering 103 at 9 a.m. The parts underneath the tongue, the sublingual and submaxillary glands, had become rapidly swollen, and to such an extent, that at 11 a.m. they were level with the tops of the lower teeth, even overlapping them, and pressing the tongue firmly against the roof of the mouth, rendering breathing very difficult and deglutition almost impossible. Some force was required to depress the tongue in order to administer small quantities of beef tea and brandy, and it was then seen by means of a reflector that the tonsils were but slightly enlarged. The extreme congestion and tumefaction were then apparently confined to the tissues below the tongue. The man had to sit up to breathe, and respiration remained extremely difficult and almost gasping. A tent of blankets was formed round the bed and constantly kept full of steam; small pieces of ice placed in the mouth, and the inflamed tissues under the tongue freely punctured. The consequent loss of blood gave slight relief. Leeches were applied below the chin, followed by poultices; blisters over the submaxillary glands. Nourishment at frequent intervals was given and swallowed with great difficulty. In the evening the condition had but little changed, though the swelling began to descend into the neck. Patient passed a very restless night, and on the morning of the 26th the parts under the chin had become greatly swollen, as also the parotid glands, while no improvement whatever was noticeable in the mouth. Although respiration remained extremely difficult there was no blueness about the face or any sign of threatened suffocation. The sublingual tissues were again incised and more leeches applied under the chin, followed by frequently changed hot poultices. Patient continued able, though with great difficulty, to swallow small quantities of beef tea, egg, and brandy. Temperature as before. The constant steam appeared to afford some relief.

November 27th. The man slept very restlessly, and but for short periods, in a sitting position. The swelling had descended further down the neck almost as far as the clavicles, but had decreased somewhat in the mouth, rendering respiration somewhat easier, as also deglutition. No collection of matter could be detected anywhere. Treatment the same.

November 28th. No change, except that the neck on both sides had become more swollen and tense, but the most careful examination could detect no fluctuation. As in the evening respiration seemed more difficult and laboured, and the swelling in the mouth had apparently increased, a small incision was made under the chin in the median line and a director gradually worked in under the tongue to the extent of nearly 2 inches, in the hope of coming upon pus, but without success. Hot poultices were kept constantly applied, which always appeared to give relief. The man had several rigors during the day.



November 29th. At 10 a.m. after a very restless night all the symptoms had become aggravated. The face was very anxious, the skin inclined to be cold and clammy and rigors more frequent. As there seemed to be a little pus in the wound made the evening before, this on consultation was enlarged, the fascia torn by means of dressing forceps, but no pus could be found even at a considerable depth, and no fluctuation detected anywhere by the finger.

At 1 p.m. patient suddenly started up and struggled with his attendant; the face became blue and suffocation imminent. Tracheotomy was at once performed, and on opening the windpipe a quantity of foetid pus mixed with blood was ejected. The trachea seemed filled with it. The matter was drawn out with sponge and syringe, but although ether was hypodermically injected the man died, apparently suffocated, soon after. 3.30 p.m. November 29, 1886.

At the autopsy, 20 hours afterwards, the swelling of the neck and in the mouth had completely disappeared; the trachea contained a quantity of pus, and the connective tissue generally of the neck and the parts below the tongue were infiltrated with it. The cause of death was the bursting of a diffused abscess into the larynx and consequent suffocation.

---

## APPENDIX No. X.

## MEDICO-TOPOGRAPHICAL REPORT.

By Surgeon-Major J. LANE NOTTER, B.A., M.D., Medical Staff.

This report bears on the country in which the writer is now serving, namely, at Meerut, Bengal. General arrangement of report.

A brief description of this place, with a few remarks on the general features of the district and its medical history, will be first given; and for the purpose of illustrating the medical arrangements for an army in the field, it will be assumed that Delhi, and the country eastward of Ghaziabad, is occupied by a rebel force, to oppose which an army corps is sent from Meerut and a second force is despatched from Bombay to co-operate with the troops from Meerut for the relief of Delhi.

Meerut is situated in the tract of country known as the Upper Doab; the district is in shape nearly a square, presenting a level alluvial plain, and has but slight elevation within it of any sort; the highest point within the whole district is about 15 miles from Meerut, and this is 772 feet above sea level, the lowest is 690 feet; this of itself shows the extreme level of this plain. Geographical position.

Meerut district is bounded on the east by the River Ganges, on the west by the Jumna river, which flows past Delhi; on the north and south there is no natural boundary. Boundaries.

The average length is 50 miles; the average breadth is about 40 miles.

The population in 1878 was 1,273,914, giving the density of population per square mile as 541, nearly twice as large as the United Kingdom, this latter being 259. Population.

The district is fairly well wooded, mango groves being abundant, and along the canals fine shisham trees grow in lines. There is no part that can actually be called jungle, except, perhaps, some patches of *dhāk*, but yearly these are being more and more cultivated. In this district there is but little of that saline efflorescence so extremely common in parts of India. The whole district is under cultivation, and the ground is everywhere level. Vegetation.

The "rabi" or cold weather crop comprises wheat, barley, grain, and peas; besides these there is also grown Indian corn, cotton, sugar-cane, and rice; the principal staple crop is, perhaps, sugar-cane.

The soil is chiefly sand and loam; there are several classes of soil recognised by the farming population depending on the quantity of loam found. Soil.

Pasture lands cannot be said to exist, and where grass is cultivated it is so coarse as to be almost unfit for horses, nor can animals graze during the rains. Pasture lands.

In the immediate course of the great rivers the soil is even less fertile, and consists of sand yielding little but rank vegetation.

In this district there are three classes of roads: the first, bridged and metalled, the road between Meerut and Delhi is such; second-class, roads bridged but not metalled; and third-class, country roads, besides village cart tracks. Roads and railways.

The East Indian Railway enters the district from Bulandshahr, and after a course of three or four miles terminates at Ghaziabad. From Ghaziabad the North-western Railway runs on to Meerut, and from thence to Saharanpur; it has a length of 56 miles in this district.

The principal rivers are the Ganges, Jumna, and Hindan.

The Ganges flows in a south-westerly direction, separating the Meerut and Bijnaur districts. It is at all times navigable for small vessels; there are no rapids. In several places there are ferries, and in one or two important villages, bridges of boats. Rivers. Ganges River.

The Jumna also flows in a south-westerly direction. In the hot weather the river is shallow, and is fordable nearly everywhere in the district. It also is navigable. Jumna river.

- Hindan River.** The Hindan river also flows through the district; it is only navigable during the rains, the average depth being only between 3 and 4 feet. There are also several smaller streams, but they do not require to be noticed here.
- Ganges Canal.** The Ganges canal enters Meerut from Muzaffarnagar, and runs for 52 miles through the district. It is chiefly used for the conveyance of goods from Roorkee to Cawnpore. The average depth of water is about 6 feet.
- Animals.** The wild animals found are the antelope, wild pig, fox, jackal, hare, wolf, and monkey. Of birds, the quail, sand grouse, partridge, and wild geese and duck in the winter.
- Snakes.** Snakes are very numerous, and very venomous; some are about 4 feet long, and they vary down to 18 inches. As many as 35 varieties are mentioned, all more or less poisonous.
- Fish.** Fish is very plentiful in this district, and is largely consumed for food by all classes. The chief varieties are *auwari*, *rohu*, and the *mahásir*.
- Domestic animals.** There no particular breeds of horned cattle in this district. Bullocks are ordinarily used for agricultural purposes, and the price varies from 20 rupees upwards. A cow costs from 15 rupees to 25 rupees, and gives on an average between two and three *seers* of milk daily. They are generally fed on *bhúsa* or chaff and *binaula* (cotton seed). The country goat gives excellent milk, and can be purchased for two or three rupees.
- Horses.** Horses are plentiful and very good; the average cost of the country bred mares is about 200 rupees. A country pony, very strong and a most serviceable animal, seldom fetches more than 80 to 100 rupees.
- The donkeys are of a most miserable description, and are only used in the brick works.
- Sheep.** Sheep are very small and poor, and no means seem to be adopted for improving the breed. They cost from one rupee eight annas each to two rupees. In the country districts they are sold at 30 rupees a score.
- Vegetables.** There is not much variety of vegetables grown—cucumbers, melons, onions, and a sort of rice called *chahera*; turnips, carrots, potatoes, and lentils, are coming more into use, and are becoming more extensively cultivated.
- Fruits.** The principal fruit is the mango or *ám*, which is common everywhere. The orange is largely cultivated near towns; also the lime or lemon, and citron. The other fruits which are cultivated are the apricot, guava, pummelow, plum, peach, pomgranate.
- Water supply.** The water supply in this district is from wells. They are *pukka* or *kuchcha*; the depth of water from the surface of the ground varies from 18 to 25 feet. The *pukka* well is lined with masonry, the *kuchcha* well being merely a deep hole in the earth without lining of any kind.
- Meerut Station.** Meerut Station is situated nearly in the centre of the district.
- The cantonments lie about three miles from the city, and are on the northern side of it. On the south of the barracks are the bazaars and native city. This latter is very well drained, a drainage system having been carried out, at a vast cost, a few years ago. There are deep *pukka* drains, running in every direction, with a fall generally to the south; there is, however, but very little fall, not more than 1 in 90; as a result, during the hot weather the canal escape (*Abu Nala*), into which the sewers flow, becomes clogged, and very little movement takes place.
- Barracks.** The barracks run from west to east, and face north. The Cavalry Barracks are situated at the north-west end of the cantonment, and have a large *maidan* between them and the railway station. They consist of bungalows in parallel buildings, ten in number. The Infantry Barracks are small detached houses; each accommodate about 22 men; the roofs are thatched. Further east, and continuing to face the line to the north, are the Royal Artillery Barracks; they are of the same description as the Infantry Barracks. The Royal Horse Artillery occupy the extreme east; the barracks are long tiled rooms, and are well ventilated by doors and windows.
- In the tiled barracks there is ridge roof ventilation. There is no overcrowding, and in no instance since I have been here has the number of men per room exceeded that allowed by regulation.
- Drainage.** The drainage in barracks is very good. Open masonry drains, having a fairly good fall, run in all directions. These are swept by hand and flushed with water as required.

The system adopted in cantonments is known as the "French system," Conservancy. Dry earth is used in the latrines, and the excreta is removed in a "Crowdy's" cart. These hold about 35 gallons, and they deposit their contents in trenches, which are filled in when within 18 inches from the surface; about six inches of clean earth is thrown on top of the sewage each day. No system could be better, and no fault can be found with it, provided the minor details are attended to; but these require looking to. The native drivers are likely to deposit their load on the surface in place of in trenches; this, however, is no fault of the system.

The water supply in this station (and district) is derived from wells, which are shallow, and, if we accept the definition of these as given by the Rivers Pollution Commissioners' Sixth Report, we may class them as dangerous; they are seldom more than 30 feet deep, often, many only one half that depth. Water supply.

The water-bearing stratum is, as a rule, sand, which in most instances is overlaid at varying distances from the ground surface by a bed of clay or *kunkur* called *mota*, but its distribution is not universal. Most of the wells receive a certain amount of their supply from side percolation, few having the masonry lower ring firmly embedded in the *mota*, thereby shutting out from "Mota." direct entry all water overlying it. All wells are dependent on the subsoil water as their main source, and also in a measure on the porosity or otherwise of the soil.

The absence in most cases of any protecting surface around the well, and the methods used in drawing water, lead to frequent impurities being introduced. In most wells the masonry ring, when such exists, is so badly put together that percolation is extremely easy and can be detected without any trouble.

Notwithstanding all this, the power of oxidation of organic impurities seems to be very potent. It is very rare to find any trace of organic matter undergoing active changes in water in this station, although there is evidence of previous contamination, as shown by the large quantities of nitric acid present. As a rule, the chlorine is small, the average of 15 samples being under 1.5 grains per gallon. In the city and villages such immunity from pollution does not exist. One peculiarity is worth notice, and that is the very rapid growth of bacteria, and the lower forms of fungi, which takes place in many instances. Fungi in water. In some experiments I made in the autumn of 1883, when enteric fever was prevalent, I followed the plan suggested by Dr. A. Smith, and which has recently been adopted by Dr. Frankland in estimating the impurity of the London water supply.

Some water was put into a clean flask, and a 2½ per cent. solution of gelatine added; the mixture forms a transparent mass, which is not moveable like the water itself. When soluble matter develops from the organic matter of the water and makes itself visible in the solid or insoluble form, it does not fall to the bottom, but each active point shows around it the sphere of its activity, and that sphere is observed. Water tested for micro-organisms.

The gelatine preserves the whole action, and keeps a record for a time both of the quality and intensity of life in the liquid.

In some wells examined I noted, "Bacteria very active; they appear as if the matrix had broken down, and they are beginning to detach themselves from it. They are present both in their primary or zoogloea form, and also free. The dumb-bell shape of bacteria *termo* is easily recognised."

In old wells and those not used fungoid spores and bacteria flourish, the latter generally free and their movements extremely active. (Note in Indian Med. Gazette, April 1883, by J. Lane-Notter.)

Filters are at all times uncertain, and are liable to become sources of evil unless looked to carefully. In this station Macnamara's filters are in use in barracks and hospitals. The general use of charcoal as a filtering medium requires more than ordinary attention, and the feebleness this material exercises over fresh organic matter, while it favours the growth of the lower forms of organic life, leads me to express a hope that another method for purifying drinking water may be adopted. Filtration. Objections to filters.

The Rivers Pollution Commissioners' Report, as well as those by Professor De Chaumont, F.R.S., in the Army Medical Department Reports, prove what I have stated above.

## Station hospital.

The Station Hospital is a double-storied building, capable of accommodating 116 patients. It is very well situated, close to the line of railway and about half a mile to the north of the cavalry lines.

It is extremely difficult to construct a building in a climate like Meerut, with great extremes of heat and cold, to suit both seasons entirely. In the hot season large openings are required for ventilation, also for tatties and thermantidotes, and in the cold weather these openings must be closed. Fire-places exist in all the wards, and wadded *purdahs* are used in winter.

The hospital is open to a free current of air on all sides.

The old infantry hospital, a thatched building, is used as a section of the station hospital when required.

Hospitals for  
Native corps.

There are also hospitals for the native troops in their respective lines. These latter are under regimental arrangements.

## Climate,

Meerut has the reputation of being one of the healthiest parts of the plains of India; this is partly due to its vicinity to the hills and to the invigorating influences of the cold season. From November to March the prevailing wind is north-westerly. In April the hot westerly winds commence; they are at times oppressive, but they produce no ill effects, and are decidedly healthy. The rains commence in July and continue to fall until the close of September, and this is an unhealthy period. The average rainfall is about 32 inches; the hottest months being May and June, when the mean monthly *maxima* temperatures in shade are about 107° and 100°, and the coldest months December and January, when the mean monthly *minima* are 44° and 42° respectively. September is the most unhealthy month of the year, being always hot and exhausting. In October, though the days are very hot, the nights become cool and pleasant.

In December and January ice is made by laying out water in thin earthen pans, and in chill nights these become covered with ice, which is subsequently stored in pits.

In May and June strong gales from the north-west come on suddenly, carrying before them clouds of dust and leaves, accompanied by lightning and thunder, frequently terminating in rain, and leaving the air very cool and refreshing. In the hot season the barracks, hospitals, and private houses are kept cool by means of *tatties*, while the circulation of air is kept up in the rooms by *punkahs* during the day and also at night. This season, though hot and relaxing, is not unhealthy.

TABLE SHOWING RAINFALL AND TEMPERATURE.

Months.	Mean Temperature.		Rainfall 1885. Inches.	Remarks.
	Last 26 years.	1885.		
January - - -	56·3	54·5	4·73	Mean rainfall 1885 = 33·36.
February - - -	61·5	56·7	Nil	
March - - -	71·5	71·4	0·34	
April - - -	81·7	79·7	0·26	
May - - -	88·5	82·3	0·66	
June - - -	91·4	89·4	3·28	
July - - -	85·8	84·8	8·16	
August - - -	84·6	81·2	15·01	
September - - -	83·2	72·8	0·27	
October - - -	75·6	73·0	Nil	
November - - -	65·0	64·1	Nil	
December - - -	60·4	58·6	0·64	

From Meerut military routes branch off to all parts of India; to Delhi, 40½ miles or three marches; to Bijnor, 38 miles or four marches; to Karnal, 64 miles or five marches; to Roorkee, 64 miles or five marches; to Umballa, 133 miles or twelve marches. There are regular halting places within each district. Military routes.

Malarious fever is the only disease which can be said to be endemic in Meerut. Statistics prove that there has been an abnormal increase since the year 1870, and that this ratio has been gradually extending. Prevailing diseases.

It has more than doubled among the European soldiers, trebled among the native troops, and quadrupled in the central prison.

The cause of all this, or, at all events, the greater part of it, can, I believe, be traced to the rise in the subsoil water in this station and district, consequent on the extensive system of canal irrigation which has during late years been adopted. The subsoil water has been gradually rising since 1869. At the close of the rains that year it was 14' 2" below the surface of the ground. On the 30th September 1885 it was 8' 11", very carefully measured by myself, this being the mean of six observations. There cannot be the smallest doubt that this disease is largely aggravated by the presence of excessive moisture in the soil, due to the obstruction of natural drainage by the canal, as well as by the railway, and is mainly the cause of the malaria which so grievously afflicts the people in the months of August, September, and October of each year during and after the termination of the rains.

A condition sometimes met with, and which is extremely obscure, is when symptoms of purpura occur closely resembling scurvy, but very different from it in its course and treatment. These cases are seen where there is an abundant supply of vegetable salts, and even the addition of these in no way improved the condition of the patient. These cases are frequently mistaken for scurvy. It is much more probable to be the effect of a hepatic germ disease of the vegetable miasmatic malarial type, in which an excess of bile acids have a powerful disintegrating effect on the cell walls of the blood corpuscles, and produce a condition to which, as a result, the purpura is solely due. Purpura.

A form of malarial disease which I have seen in Meerut, and in no other station, is paroxysmal congestive hepatic hæmaturia. The peculiar feature of this form of fever is the high specific gravity of the urine, 1030, the large amount of albumen, and the total absence of entire blood cells in the urine, although this is loaded with the *débris* of red blood corpuscles. The intermittent character of the urine is almost diagnostic; one day pale, clear, of normal specific gravity, containing no albumen and depositing no lithates; the next day, chocolate brown colour, opaque, having a high specific gravity, depositing albumen, and containing sugar. Malarial hæmaturia.

I have observed these two conditions in one day, and they were associated with hepatic congestion.

The microscopic examination showed granular cells, renal casts, and hæmaturin coloured granules scattered through the field.

The presence of tube casts points to renal congestion, while the intermittent character clearly shows that this is *not* disease of the kidney as ordinarily understood.

Another remarkable feature is the absence of blood corpuscles, thus differing entirely from ordinary hæmaturia, the contents of the blood corpuscles alone passing into the urine. The transitory condition of the urinary symptoms shows clearly that the exciting cause could not be of constant operation, and that it must be due to malaria, which we know is liable to assume an almost endless variety of form.

Enteric fever prevails at Meerut. It is generally of a severe type, and frequently cannot be traced to either air or food supply. Enteric fever.

From the cases that have occurred within the writer's experience in this station he is almost inclined to assign the cause to climatic influences operating on the young soldier, added to which there is some telluric condition, still, if at all, imperfectly understood, which induces the attack; the disease is so sporadic in character, and attacks so frequently those who have recently arrived in India, that after the most careful investigation, I am, in some cases, compelled to dismiss the causation usually assigned to it in England as being

*always* the one to attribute it to here, though I am fully aware that there are cases in which it has been communicated by impure water, more than one instance having come under my personal care.

Predisposing  
causes.

The predisposing or exciting causes, whatever they are, assigned or operating in the production of enteric fever, are extremely perplexing to the etiologist, so diverse, uncertain, and opposite do they appear. But it is very probable that the primary development of the disease demands a combination or concurrence of circumstances still imperfectly, if at all, understood, but obviously dependent on local conditions.

These circumstances, if their action is prolonged, insensibly modify the constitution exposed to them, and to such a degree as to produce a dyscrasy, in which the slightest cause may determine the evolution of the malady.

Cholera.

Cholera appears in an endemic form in certain years. It certainly appears to be on the decline. When epidemic in this station it is generally introduced by pilgrims from Hurdwar fair.

Its causation is as undetermined as it ever has been, but there is some evidence that whatever external influence may assist its growth it is a disease depending in part on telluric causes; in other words, that there are certain areas in which the disease becomes converted into a cholera poison acting on the human economy, probably through ground air, which has not yet been investigated with sufficient care. I am quoting solely from my own experience and observation.

The epidemic I witnessed forbids the idea of any theory that would embrace either water or food being the cause, as the disease only attacked 22 persons, who were widely separated, and it was too limited in its extent to build any theory.

One feature may be worth noting, and that was the absence of any electrical condition in the air, as evidenced by the occurrence of lightning and thunder, so common towards the close of the rains, when the disease was at its height. I made most careful observations as to the condition of the ground water, but all evidence went to disprove any connexion whatever between this and the occurrence of the attacks.

The ground water varied so little in height (half an inch) that it could not have the smallest effect in exciting or controlling the disease.

Analysis of air.

Some experiments, which gave only rough indications, showed that the carbon dioxide in the ground air was considerably larger than is usually found under similar conditions in England.

---

## APPENDIX XI.

## SOME REMARKS ON "BERI-BERI," A DISEASE LARGELY PREVALENT IN THE STRAITS SETTLEMENTS, WITH A FEW NOTES OF CASES, &amp;c.

---

By Surgeon A. A. LYLE, Medical Staff.

---

Amongst all the "standard works" on the theory and practice of medicine at the present time, the one alone which deals at any length with the subject of this report appears to be Sir Joseph Fayrer's work on "Tropical Diseases," and in which he refers to this disease as "acute malarial oedema." The subject is one about which very little is known either as regards its pathology or its successful treatment. It is very seldom to be met with out of certain districts, and therefore comparatively few have any opportunity of studying the disease with a view to pathological research or towards a more successful line of treatment. It is a subject of the utmost moment to many thousands of persons who suffer from, and annually succumb to, this most fatal and distressing malady. To say that it is only second to malignant cholera as regards its mortality, and the suffering which it engenders, is no exaggeration of facts. If cholera is more traceable to climatic, alluvial, or insanitary sources, if it is quicker in its invasion as well as in running its deadly course, or if it is more general in its attacks on different races and peoples, beri-beri is none the less sure in its results, though it may be more insidious and prolonged, though hardly less distressing to witness, in pursuing its ravages.

The disease beri-beri does not appear to have been recognised or described previous to the year 1877, when it first appeared during the monsoon of that year in the districts around Calcutta. Towards the conclusion of that rainy season it appears to have subsided, but only to return in the following year over a more extended area. During the years 1878 and 1879 numerous fresh cases occurred in Dacca, in Shillong (on the Cossyah Hills), in Cachar, and in Assam. The general opinion being that it was imported originally from Dacca or some of the districts in Assam proper.

*Etymology.*—Nothing really authentic is known of the etymology of the word "beri-beri." A word occurs in the Hindi language, i.e., "bhēree," which signifies a sheep"; and it has been supposed that this is the origin of the name on account of the very remarkable sheep-like gait of persons suffering from this disease. The suggestion strongly recommends itself to anyone who has had some experience in the treatment of cases, as the peculiar "walk" is regarded as almost diagnostic of the complaint. Another Hindi word, "bher-bheri," means a "swelling" or puffiness or enlargement; and this is a very general condition of persons suffering from "beri-beri." Other ideas of the derivation of the word are (1) a Cingalese word, meaning "a weakness;" and (2) an Arabic word "bhayr," which indicates "dyspnœa," another very remarkable and most distressing and fatal symptom of the disease.

*Geographical distribution.*—It has been said that beri-beri prevails in Southern India, on the Malabar coast, but does not occur more than 40 miles inland. It is, however, unknown on the Coromandal coast or in Madras town itself, which is certainly the hot-bed for most diseases amongst natives in India.

Whatever localities throughout the Indian peninsula may be infected with this epidemic disease, it may be said to exist to a very limited extent only, and it is not regarded as a "prevailing disease," or, indeed, known to exist at all, amongst native troops or camp followers in Madras proper, the tableland of the Deccan, the Central Provinces, Oude, or the districts around Bombay.



It is recognised, however, as endemic in Ceylon, distinctly epidemic in the Straits Settlements, and throughout the Malayan Peninsula generally. In addition, it is said to be very common in Japan, where it is called "ka-kee."

*Ætiology.*—It may be said that the ætiology of "beri-beri" is still wrapped in obscurity. According to some observers "anæmia" has been attributed as a cause; the general consensus of opinion, however, shows that this has nothing to do with the origin of the disease. Beri-Beri patients may become—and invariably do become—anæmic, this condition being the result of the disease, and not the reverse. It is now regarded as an established fact that "beri-beri" is none other than the result of a specific poison, but as regards the nature or source of this poison there is still some uncertainty. By many authorities on this subject it is supposed—and not without good reason—to be some miasmatic or malarial influence. This idea is evidently regarded as of some importance by Sir Joseph Fayrer, who describes the disease as *acute malarial œdema*; and further than this, it is quite compatible—supposing it to be of "bacillic" origin, which is quite the most recent idea—with the other theories as to malarial poison, since the later views of *Klebs* and *Tommasi-Crudeli* attribute "ague" to a low organism of the nature of bacillus, to which they have given the name of "bacillus-malarial," and which they believe to be propagated in the presence of decaying vegetable matter. Some other observers maintain that this disease is the result of a kind of "zymotic" poison, arising from overcrowding and deficient ventilation, and again from some peculiarity in the food. It has been suggested that a deficiency in the "nitrogenous products," or, more probably still, the salts and carbon (such as a purely rice diet would occasion), may be the cause of this peculiar affection; but this will not account for all outbreaks, occurring, as they do, in different places and amongst peoples of varying habits. It may be that some common article of food—rice, for example—may undergo some alteration of condition and develop some animal organism, the result of fermentation. The ergotism of rye would afford an example of this suggestion. There is no doubt but that proper and sufficient cooking of food in an infected locality has a beneficial effect on the occurrence of cases. Dr. Lacerrda (Brazil) has attempted the cultivation of "microbes," which he believed he discovered in the blood of patients suffering from "beri-beri," but his success has been doubtful. Dr. Taylor, of Japan, is reported to have found "microbes" in the rice and in the soil of rice (paddy) fields where this disease prevails. Dr. Max. Simon, Colonial Surgeon at Singapore, who has seen a vast amount of this disease and made a special study of it, is inclined to think the latter theory of causation the most probable, as it seems to him the only way of accounting for all the epidemics which he has seen or heard of. Further, he is inclined to believe that the diseased condition of the rice—whatever it may be, whether organism or not—is probably capable of being rendered inert by proper and sufficient cooking.

*Varieties.*—There are two distinct forms of beri-beri, and they have many points of difference. It cannot be said that one form occurs more frequently than the other, or that either is indigenous to localities or affects certain classes of people. These two forms of this disease are classed, 1st, moist "beri-beri," which is characterised by and accurately described as a "general hydropsis" of the system. This term exactly conveys the symptoms and appearance of a patient suffering from the complaint. The second form of this disease is termed, 2nd, dry "beri-beri," which is characterised in a very remarkable way by paralysis, which is invariably peripheral.

*Symptoms.*—In both conditions of "beri-beri" there is certain loss of sensation and power in the muscles, although it is nothing like so marked in the "moist form" as in the "dry." The earliest symptoms in the former are pains in the lower extremities, especially in the knees; this is followed by a loss of sensation—a numbness—in the legs and ankles, and subsequently at a short interval by swelling, the result of a serous form of effusion into the subcutaneous tissue. In the course of a few days the arms and hands become similarly affected, and the swelling and effusion gradually extend to the trunk and subsequently to the face and neck. The abdomen becomes enormously distended, but the fluid is not found in the peritoneal cavity, but in the abdominal walls themselves. The pleural cavity, however, becomes filled with fluid, and causes much distress owing to the dyspnoea it occasions. Large

quantities of fluid may be removed by "aspiration" from this cavity, but only very temporary relief is afforded, as it quickly refills, and besides this the weight of fluid in the "integuments of the chest walls" occasions the "dyspnœa" almost as much as the fluid inside. It may be mentioned here that there is no abnormal condition of heart, liver, or kidneys which would in any way account for this dropsical condition. The urine is invariably normal in quantity and also as to chemical reaction. Sometimes there is a difficulty in passing the urine, but this is accounted for by "mechanical obstruction" caused by the large effusion of fluid into the "corpus cavernosum" and areolar tissue of the penis. The organ has the appearance of being "twisted upon itself," which gives it the unique and almost diagnostic condition usually known as "ram's horn penis."

The second variety, or "dry beri-beri," differs considerably from the "moist variety," in that there is no appreciable effusion of fluid in any part of the body, and the paralysis is more distinctly marked. It is a fact well worthy of record that this paralysis is undoubtedly peripheral and not central. It is quite inconceivable how effusion of fluid round the spinal cord—if it is present in dry beri-beri—could, by means of pressure, cause different effects to an effusion of blood in the same place. No other means of accounting for this paralytic condition has as yet been suggested. "Dyspnœa" in this condition is another remarkable and most distressing symptom. The suddenness of its invasion, its intensity, and its fatal effects, make it one of the most important features of this disease. A patient suffering from some of the earlier symptoms may suddenly become affected by it, and so intense is the agony occasioned by the "cardiac neuralgia," or whatever the condition may be called, the patient dashes himself about in a violent and only semi-conscious manner, and frequently destroys himself by any available means at his disposal. Cases have been reported of Chinamen hanging or strangling themselves by means of their "cue" or "hair-plait" rather than continue in suffering.

*Treatment.*—Tonics, such as strychnine and arsenic, are supposed to have some effect—certainly in the "dry form"—"galvanism" also. The chief success has been found in a carefully cooked and sufficiently varied dietary, increased area of atmosphere, and isolation of cases. The severe dyspnœa is sometimes relieved by blisters over the pericardium and a drop or two of "nitrite of amyl" inhaled on lint. Fresh pineapples, and a decoction made of the skins of pineapples, have also a good effect, acting as "diuretics"; these are also most grateful to the patient. Small doses of "nitro-glycerine" (i.e., ten minim doses of a 10 per cent. solution every three hours until headache is produced) has also a good effect in increasing the flow of urine and relieving the "hydrosis" of the system, by decreasing (probably) the "vascular tension." In the moist form aspiration of chest and abdomen has been tried, but no good or permanent result has followed this line of treatment. "Southey's drainage tubes" have also been used in this form, and large quantities of fluid have been removed by them. These tubes, however, invariably occasion bad sloughing ulcers at point of introduction, and are therefore found unsatisfactory. In treating the profuse diarrhœa which is frequently met with in the advanced forms of this disease the following is the most effective means of checking it, i.e.,—

℞ Liquoris morphinæ hydrochl., ʒ i.  
Plumbi acetatis, gr. iii.  
Aquæ camphoræ, ʒ i.

every fourth hour up to sixth dose.

*Post-mortem appearances.*—As in cases of cholera, the post-mortem appearances are, practically speaking, *nil*. Muscular degeneration and general anæmia are the chief conditions met with. In deaths occasioned by beri-beri dyspnœa, an altered condition of the muscular and nerve fibres of the heart are found. No microscopic examination of the fluids or tissues of any cases of "beri-beri" have been made recently in this part of the Straits Settlements, or, indeed, is there any sufficiently powerful microscope at present available. There is no greater field for pathological research afforded by any disease more than the subject of these notes, and doubtless in the present advanced and advancing study of the microscope some very important discoveries may be made in connexion with beri-beri. There is no disease which

more distinctly points to the presence of some "animal organism," microbe, bacillus, or whatever name it may hereafter be described under. Following these short remarks, on a somewhat limited experience of the subject under consideration, will be found a few notes of cases which have been under treatment in the Pauper General Hospital at Penang, Straits Settlements, as well as a brief description of an outbreak—the first appearance of the disease in these parts—which occurred in the Criminal Prison, Penang, Straits Settlements, during the year 1882, and obtained from the Annual Report of the Colonial Surgeon in charge for that year.

## CASE No. I.

## "Moist Beri-Beri."

"*Cho Lim Sock*," a Chinese coolie lately arrived from China (three months previously), was admitted into the Pauper General Hospital, Penang, on the 13th December, 1885, and was examined on the following day: He stated that his age was 34, but he looked older than that: he complained of weakness and swelling of the whole body: said he had been ailing for 20 days.

*History.*—Has always had a sufficiency of food, which usually consisted of rice, salt fish, and vegetables: has never had a similar illness before: he first noticed this attack by a slight swelling in both feet about three weeks previous to his admission to hospital, this gradually extended to the rest of his body: has never felt any particular pain, but a "distinct numbness" and loss of sensation in both calves.

*State on Admission.*—His general appearance was only remarkable on account of his dropsical condition.

*Alimentary System.*—Tongue somewhat pale and flabby, appetite good, bowels regular: abdomen prominent, bulging slightly at the flanks, is tympanitic, no fluid can be detected in the peritoneal cavity, abdominal walls dropsical: subcutaneous tissue infiltrated: liver, as far as can be made out, normal.

*Hæmic System.*—Normal, the blood shows numbers of what appear to be half developed red corpuscles, i.e., pale yellow in colour, and about half the natural size.

*Circulatory System.*—Normal: pulse 94, full and strong.

*Respiratory System.*—Normal.

*Integumentary.*—Skin dry, and that over the legs tense and shining: there is some inflammation of the skin over scrotum, and about perinæum: there is œdema over the whole body, more especially in the legs and penis: the surface of the body feels tense, especially the thighs and calves.

*Urinary.*—Normal: urine normal in amount, chemical reaction and specific gravity.

*Nervous.*—Has a feeling of numbness about both calves—sensible to touch, heat, or pain: organic reflexes normal: tendon reflex is absent: voluntary motor functions normal: appears to feel a strong Faradic current but slightly in the legs, not in the arms: cerebral and mental functions apparently normal.

He sleeps fairly well, and does not suffer from thirst.

*Treatment on Admission.*—Milk diet with pineapple juice.

℞ *Liquoris strychniæ* ℥. iv.  
*Infusi calumbæ* 3 i.  
 ter in die.

Electric current to be used daily. Ten days after admission the pleural cavity was found filled with fluid: "paracentesis thoracis" performed, and about 60 ounces of serous fluid drawn off with aspirator.

Fifteen days after admission diarrhœa set in, loose watery bilious evacuations almost incessant, which all treatment failed to stop, and the following only proved a temporary check, i.e.,

℞ *Liquoris morphinæ hydrochloratis* 3 i.  
*Plumbi acetatis* gr. iii.  
*Aquæ Camphoræ* 3 i. s.s.

quaque quatuor hora.

Death subsequently took place from exhaustion on the 20th day of admission. *Post-mortem* revealed nothing abnormal, except some splenic enlargement and general hydrosis.

No microscopic examination made of the fluids, no high lens power being available.

No albumen found in the fluid drawn from the chest cavity.

#### CASE No. II.

##### "Dry Beri-Beri."

*Choa Chim Hong*, Penang-born Chinese, aged about 26, water-carrier by trade; admitted into Pauper General Hospital on January 2nd, 1886, suffering from severe pain in chest, numbness and loss of power in both legs, also loss of power in both upper extremities.

He stated that he has been ill for about a month: his food consisted of salt fish, rice, and some vegetables: lived in a dark damp room, with deficient ventilation. He first noticed sudden numbness and loss of power in both knees: this gradually extended to the thighs and legs: severe pain in the chest came on about 10 days before admission, and numbness of the arms and hands came on simultaneously.

On admission nothing abnormal was noticed in his appearance, except his anæmic condition, and his indescribably peculiar walk.

*Alimentary*.—Tongue clean, appetite good, bowels regular (2 in 24 hours), liver dulness normal.

*Circulatory*.—Severe pain in præcordial region, which he describes as feeling like some one "tying him inside": pain constant and increasing, and aggravated by coughing or pressure. No dyspnœa. Apex beat normal: pulse 96, regular, rather weak.

*Respiratory*.—Normal: occasional cough.

*Urinary*.—Urine scanty: chemical reaction normal. Sp. gr. 1.014, acid.

*Nervous*.—Numbness of upper and lower extremities. "Tendon reflex" absent in both legs. All the muscles are tender on pressure, and there is no response to the Faradic current.

*Treatment*.—Milk diet with pineapple juice,

Strychnine tonic.

Faradic current daily.

On 2nd day of treatment the præcordial pain became aggravated, otherwise his condition was unchanged: two days later on, visiting him in the morning, he was found in excruciating agony, dashing his head on the floor, throwing himself about in every direction, endeavouring to strangle himself with his pig-tail, unable to speak, and suffering from severe dyspnœa. A blister was placed on his chest over the heart (when he had been sufficiently restrained) and nitrite of amyl administered on a pocket handkerchief, but no treatment availed, as he died asphyxiated within half an hour.

*Post-mortem* revealed only œdematous condition of the muscular fibres of the heart, effusion into the pericardium, and enlargement of the spleen: lungs much congested.

#### CASE No. III.

##### "Moist Beri-Beri."

*Chew ah Chow*, a Penang-born Chinese cooly, employed in a sugar plantation near Penang, aged about 32, was admitted to the Pauper General Hospital on 27th December 1885. He stated that for five or six weeks he had been suffering from fever, and this had been followed by swelling of the body generally, especially of the penis (*ram's horn*), hands, feet, legs, and stomach: he said his custom was to smoke opium, and was generally under its influence for eight hours out of the 24.

His general appearance indicates anæmia and general hydrosis of the body and extremities: his penis is distinctly of the ram's horn shape, and he states this was the earliest symptom of his present condition.

*Alimentary*.—Abdomen considerably distended owing to fluid in subcutaneous tissues, otherwise normal: appetite fairly good: bowels regular.

*Hæmic.*—Normal; blood apparently healthy.

*Circulatory.*—Occasionally slight difficulty of breathing: præcordia, normal in appearance, apex beat 4th and 5th ribs internal to nipple: carotids can be seen pulsating in the neck.

*Integumentary.*—Skin dry: marked œdema of both legs, skin of which is tense and shining: penis has the ram's horn appearance: hands and arms œdematous: micturition difficult on account of the condition of the penis.

*Nervous.*—Numbness in both legs; sensibility to touch, heat, and pain is good: organic reflexes normal: tendon reflex absent.

*Locomotion.*—Pain in the calves of legs and thighs on pressure, or on attempting to walk.

*Treatment.*—Tonics and galvanism: pineapple diet.

*Termination.*—Fatal on 15th day after admission: immediate cause of death, diarrhœa.

#### NOTES ON AN "OUTBREAK OF BERI-BERI" AT THE CRIMINAL PRISON, PENANG, STRAITS SETTLEMENTS.

During April 1882, 186 prisoners arrived from Singapore by steamer, of whom 36 were found to be suffering from beri-beri on arrival. These cases were isolated as far as possible. Recognising the nature of the disease, a generous diet was improvised in anticipation of a special dietary which was to follow later. As it was understood that all the affected prisoners from Singapore had been located on the ground floor without any basement ventilation, special care was taken to locate the unaffected prisoners in the upper story. Fifty-one Singapore prisoners were placed on special diet, to which number was added any who became subsequently affected. The strictest sanitary precautions were adopted, as the prison was somewhat overcrowded. The latrine buckets of the Singapore prisoners were daily inspected and disinfected. On June 4th all the Singapore prisoners who had been placed on special diet had done well, and although several fresh cases had occurred, these were of a modified type. On the above date, however, one of the prisoners not on special diet was admitted to hospital suffering from "dropsy," and died on the 10th June from an "acute form of that disease." About this time several fresh cases occurred amongst the Penang prisoners for the first time, and each assumed the acute form. The entire prisoners were then placed on special diet with certain extras, and in addition extra accommodation was allotted to prevent overcrowding. The outbreak of disease amongst the prisoners ceased in July 1882, almost as suddenly as it had occurred. Of the 186 prisoners sent from Singapore in April, only 22 remained unaffected by the disease when it ceased in July of same year and 27 proved fatal. Amongst the Penang prisoners (240) 61 cases occurred, and 12 proved fatal. The following three causes for the epidemic have been assigned, i.e.,—

1st. Personal contact; contagion.

2nd. Food supply or some "ingredient."

3rd. Propagation of disease through excretæ.

The cause of the outbreak is undoubtedly obscure. After careful examination of the details connected with the outbreak—the course of the disease; its decline; the prisoners attacked; their location in the prison at night; and other matters, the first two assigned causes may be set aside, but grounds exist for believing that the disease in this instance may have been propagated by "excretæ."

APPENDIX XII.

---

REPORT OF A CASE OF ENTERIC FEVER OCCURRING TWICE  
IN THE SAME INDIVIDUAL.

---

By Surgeon-Major A. LEWER, Medical Staff.

---

On 10th September 1884 Private W.D., 12th Royal Lancers, aged 25, was admitted into hospital at Bangalore, India, and discharged to duty on 13th November 1884, having suffered from enteric fever. The following brief remarks touching the salient points of the case are extracted from the hospital records.

"A moderately severe case, very protracted. Headache. Temperature chart characteristic, normal 39th day. Diarrhoea, tympanitis, and tenderness right iliac fossa. Rose spots. Relapse, prolonged convalescence."

On 6th June 1886 Private W.D. was admitted at Bangalore for the second time suffering from enteric fever, which proved fatal on 17th June 1886. The post-mortem evidences were characteristic of the disease; recent lesions in the ileum, &c., but in addition there was found a very large and distinct mark of an old ulcer, which had healed up a long time prior to his admission to hospital on the second occasion; in the site of Peyer's patches at the lower part of the ileum.

The following remarks touching on the salient points of the case and the post-mortem appearances are also extracted from the hospital records.

"A severe case, high temperature, lung complications, pneumonia, hæmorrhage from the bowels, died comatose.

"*Post-mortem.*—Both lungs and spleen highly congested. Towards the lower end of the ileum there were a number of deeply ulcerated Peyer's patches, and a large mass of ulceration just at the ileo-cæcal valve. There was a mark of an old ulcer that had healed up."

The cause of the old ulcer found in this situation could not be accounted for except as the result of the first attack of enteric fever. He had never suffered from dysentery or other bowel complaint. The exhaustion of susceptibility or not in this case is very interesting from the opinion held of the supposed immunity from a second attack conferred on those who have once suffered from enteric fever, viz. :—

"That by the action of the contagion there is produced an indelible impression on the system, and the body no longer presents to the germs the elements they require for propagation."

N.B.—The portion of small intestines was inspected by four medical officers, who noted the presence of old ulceration which had, apparently, no connection with the second attack.

---

## APPENDIX XIII.

## REPORT OF A CASE OF "CONCUSSION OF THE SPINE."

By Surgeon J. G. HARWOOD, Medical Staff.

Lance-corporal H——, a well-built young soldier of medium height, dark brown hair, and fresh coloured complexion, aged 21 years, and with 2½ years' service, was brought to the North Camp Hospital, Aldershot, on the 21st July 1886, with the following history.

He stated, and his evidence was borne out by his comrades, "that he had been bathing in the Basingstoke canal that afternoon, and took a dive into, what he thought was, deep water. He became insensible. His comrades immediately dragged him out of the water, and, upon his regaining consciousness a few minutes later, he found that he had lost all power of locomotion and sensation in his lower limbs, and was perfectly helpless."

He was at once taken to the hospital, and his condition on admission was found to be as follows:—

*External Appearances.*—A small scalp wound on the anterior portion of the left parietal region. Breathing apparently unimpaired. On examination of the spinal column there was no irregularity to be detected anywhere, and percussion elicited no pain at any spot. It was found that there was complete loss of sensation from the last ribs downwards. Above the last ribs sensation was unimpaired. Loss of motor power in lower extremities was complete; he could move his arms, but the movement was impaired.

*Treatment on Admission.*—He was placed in the horizontal position on a water bed, and from the following day, when it was found that his urine and fæces were being passed involuntarily, his urine was drawn off three times a day, and his bladder washed out with a weak solution of carbolic acid.

*Progress.*—His temperature rose slightly for a day or two after admission and then went down to normal, and remained so.

Bedsores quickly made their appearance, and on the 30th of August he was transferred to the Cambridge Hospital for the benefit of nursing.

On arrival at the Cambridge Hospital it was found that he had two bedsore—one a large one, situated towards the left of the sacrum, which extended very deeply, and another one over the right hip, which was more superficial and not so severe.

They were treated as follows: they were protected from pressure by pads of spongio-piline, having holes cut into them for the sores, which were dusted over with iodoform.

His appetite continued fairly good, and he slept well. On the 1st of September a poultice was applied to the larger sore and a slough came away.

He was ordered tinct. nucis vomica, m. x., three times a day. His position in bed was frequently changed, so as to diminish the chance of more bedsore occurring. He continued perfectly comfortable and free from pain. On the 7th of September his feet commenced to show signs of impaired vitality.

On the 30th of September I took over charge of the case from Surgeon Saunders and found the following condition of things:—

On examining the vertebral column no irregularity was observed anywhere. Each vertebra was in its proper place and regular. No pain was elicited on palpation or percussion.

*Sensation.*—On pricking him with a pin in various parts of his body I found sensation unimpaired above the nipple line, but below that line it was lost completely.

*Motion.*—There was complete loss of power over the muscles of the abdomen and lower extremities. He could raise his arms from the shoulder and flex his elbows, but when asked to pronate or supinate his forearms, or to flex or extend his fingers, he was unable to do so.

*Reflex action, superficial reflexes* were observed to be weakened. The cremasteric, epigastric, and abdominal reflexes were sought for in the manner described by Dr. Gowers; they were all present, but weakened.

*Deep reflexes* were very much weakened; patellar and ankle clonus could only be obtained on applying a galvanic battery. Urine alkaline clouded and passing involuntarily.

Temperature was normal, and the same in different parts of the body.

There was no dysphagia or dyspnoea, and he expressed himself as feeling perfectly comfortable and free from pain. The bedsores were two in number: one a large unhealthy looking sore, situated a little to left of the sacrum, 4 inches across in its largest diameter, and evidently increasing. This was very deep, and showed no signs of improving. The other one was smaller in size and more superficial; it was situated over the right hip; in this one there was an attempt to repair being set up, and near its margin were seen numerous unhealthy looking granulations.

I ordered these bedsores to be thoroughly cleansed every morning with a weak solution of carbolic acid (1 in 40), and then to be dressed with carbolic oil on lint, and this treatment I saw carried out myself.

Other parts of his body, on which he was resting, to be well rubbed with spirit, vini rectificat, twice a day.

The lesion of the cord was evidently in the lower cervical or upper dorsal region.

I continued the treatment of Surgeon Saunders until the 1st of November, when I commenced to give him iodide of potassium, grains 20, three times a day, thinking that this latter remedy might aid in the removal of any products of inflammation which might be pressing on the cord.

I also during November had him galvanized daily.

His general health remained good, and his appetite was excellent, and he slept well.

Towards the end of November slight improvement was noticed in his powers of sensation, and he would feel a pin when either foot was pricked.

The bed sore over the sacrum, however, showed no sign of improvement, but went from bad to worse, and exposed a large piece of the sacrum.

About the middle of December it was evident that the depressing effect of this large bed sore was beginning to tell on him. His temperature commenced to rise nightly to 102° F. and 103° F.

At this time he had rigors and hectic, which were very suggestive of septic poisoning. He was free from pain, and comfortable, but it was evident from his appearance that he was losing ground.

It was then decided to place him in an upright position and support him from the shoulders, so as to relieve the back from all pressure, and thus give the bedsores a chance of setting up a healthy action. This treatment was persevered in for several days with great advantage, and his temperature remained at the normal point.

There was no spot in which there was hyperæsthesia of the skin above the parts affected with loss of sensation.

On the 24th of December he was worse, he was attacked with vomiting, diarrhoea, and dyspnoea, and his temperature began to rise again.

He was given stimulants and bark, and the iodide of potassium was stopped.

There was no true girdle pain complained of, although the dyspnoea was very troublesome. He gradually got worse until the 30th of December, when he died quietly at about 3.30 p.m. from exhaustion.

*Post-mortem examination* made 44 hours after death.

Body was fairly well nourished. The muscles of the lower extremities were considerably atrophied.

*Bedsores.*—One large one, about 6 inches across in its broadest part, situated at the back part of the sacrum, which bone was exposed. The other sore, smaller in size, over the right hip, showed signs of healthy action being set up.

*Head* was not examined.

*Vertebral column.*—On exposing the vertebræ in the cervical region it was found that the left tubercle of the spinous process of the sixth cervical vertebra had been knocked off.



The left superior articular process of the same vertebra was also injured, and was partially necrosed on its outer margin, looking as if, at some former time, it had been considerably bruised. The ligaments attached to these parts had been partly detached.

There was no opening into the spinal canal. On dissecting out the cord at this part I found, first of all, that the membranes were rather anæmic and adherent to each other, and that the pia mater and arachnoid were adherent to the cord. Above and below this part there had been hæmorrhage into spinal nerve roots on each side of the column and involving both the anterior and posterior roots, chiefly of the seventh cervical nerves, and also, to a less extent, the sixth cervical nerve. The cord itself was much softened and presented under the microscope the following appearances. The anterior columns were smaller than natural; the column of Goll on each side of the anterior commissure were represented by a mere strand of fine connective tissue. The posterior columns showed that the myelin was swollen.

Much difficulty was experienced in getting a good section of the cord cut, as it was very soft even after being over a fortnight in spirit.

*Chest.*—Right lung and pleura adherent; the left was normal in appearance. Both were hypostatically congested.

*Heart* was of natural size; valves competent and healthy. The left ventricle was full of dark looking blood.

*Other organs* were healthy in appearance and of natural size.

In the absence of other conditions to cause a fatal issue in this case, it was presumed that some of the septic material from the bedsores had been absorbed, which had set up such a condition of things in the blood as to account for death in a patient already considerably weakened by the exhausting effects of the bedsores.

---

## APPENDIX No. XIV.

## CASE OF EMPYEMA.

By SURGEON-MAJOR O. G. WOOD, M.D., Medical Staff.

Sergeant-Major A. S., 1st Battalion Seaforth Highlanders, age 40. Service 17, about 12 years in India. Was admitted into the Station Hospital, Edinburgh Castle, on 16th February 1886, suffering from pneumonia of left base and pleurisy. Patient was a somewhat unhealthy looking man, who had been suffering from a "cold" for six or eight weeks, which he had entirely neglected. He had been all through the Afghan War with his regiment, and afterwards in the Egyptian Campaign of 1882. During these campaigns he had suffered a good deal from dysentery, but had never been in hospital for it. The officers of the regiment noticed that his general health had been failing for nearly a year, though he himself had felt quite well.

The pneumonia ran a severe course, the crisis not occurring till the 9th day of the disease. From this time the pleurisy began to take a prominent position, a considerable quantity of effusion occurring into the left pleural cavity. This caused very considerable dyspnoea, but the temperature remained about normal until the evening of the 3rd of March (18th day of disease), when it suddenly rose to  $100.4^{\circ}$ . This rise of body heat was preceded by a distinct rigor, which was attributed by the patient to an attack of Indian fever. From this date onwards the temperature kept steadily a little above the normal standard during the day, but used to rise to between  $100^{\circ}$  and  $101^{\circ}$  about midnight, occasional rigors occurred, dyspnoea increased, and the pulse grew gradually weaker. With these symptoms the physical signs indicative of the presence of fluid in the pleural sac persisted unchanged, absolute dulness and complete absence of vocal fremitus extending over the lower third of the lung. Empyema was diagnosed, and was confirmed on 10th March (25th day of disease) by inserting a hypodermic needle into the fluid, and drawing off a few drops of pus. Accordingly, in consultation with Surgeon-Major Langdon and Dr. Claud Muirhead, of the Royal Infirmary (who had been called in at the request of the officers of the regiment), an aspirator needle was on the 12th March introduced between the 8th and 9th rib at a spot just posterior to the axillary fold, but without finding any fluid whatever. A second puncture was then made between the 7th and 8th ribs about two inches posterior to the first one, and about 1 oz. of thick curdy pus, which flowed very slowly and ultimately blocked the needle, was withdrawn. The patient feeling rather faint, the needle was withdrawn, and the puncture carefully closed with piece of antiseptic wood wool and collodion. This operation was followed by a considerable rise of temperature and great pain at and around the site of the second puncture, and during the night there was a good deal of low delirium. After this he improved very slightly until the afternoon of the 15th March, when he had another rigor, which was repeated on the following day. The patient now began to show signs of exhaustion, being worn out with pain, constant tickling cough, and loss of sleep; and his appetite failed him entirely. It was therefore decided to perform free paracentesis, and drain the pleura thoroughly. On the morning of the 21st March (36 days from commencement of the pneumonia), assisted by Brigade Surgeon Fishbourne (retired pay) and Surgeon B. L. Mills, M.D., who placed the patient under the influence of a mixture of chloroform and ether, I made an incision about  $2\frac{1}{2}$  inches long through the skin and muscles; the centre of the incision corresponding to the site of the successful puncture with the aspirator, that is to say, between the 7th and 8th ribs, posteriorly. The pleura was then carefully punctured, and the opening enlarged with a probe-pointed bistoury until it was sufficiently large to admit a medium sized india-

rubber drainage tube. A few ounces of thick curdy pus and flaky lymph were evacuated, the drainage tubes inserted, and the cavity washed out with a tepid solution of carbolic acid, 1 in 100, until the solution returned fairly clear. A large dressing of sublimated wood wool was applied to the wound, and the patient laid on his back, but with his shoulders well raised. The operation was conducted under the carbolic spray. During the day the wound drained very freely, so much so that the nurse was obliged to change the dressings. This was done without antiseptic precautions.

From this date the patient began steadily to amend. The cavity was washed out daily with a tepid solution of carbolic acid, which maintained the discharge aseptic throughout. The discharge, at first thick, flaky, and abundant, gradually decreased, and the lung re-expanded. The temperature fell to sub-normal, the appetite returned, cough diminished, the pulse increased in force and volume, and convalescence advanced without a check.

On the 3rd April, 14 days after the operation, the tube was removed. The same night the temperature rose somewhat, consequently the tube was partially replaced with considerable difficulty. As it turned out that on the day the tube was taken out he had had an exciting conversation with a friend, the rise was probably unconnected with its removal. Consequently, when on the 6th April the tube fell out on the dressings, no attempt was made to replace it, and no symptoms followed.

On the 9th April he was allowed to sit up for a short time, and from that day his amendment was rapid.

By the 6th May the wound had completely healed. The cicatrix was a little depressed, and the interspace where the puncture had been made had retracted a little; otherwise there was absolutely no retraction of the chest.

The lung fully expanded, respiration being distinctly audible to within half an inch of the seat of puncture.

On 28th May the patient was invalided from the service, and left two days later for the Isle of Wight, where he is now living in the enjoyment of very fair health.

---

## APPENDIX XV.

## REPORT ON THE ABU FATMA HOSPITAL AND LINE OF COMMUNICATION WITH NILE EXPEDITION, 1884-85.

By SURGEON-MAJOR L. CORBAN, M.D., Medical Staff.

During the Nile Expedition the advanced post of Abu Fatma became a station of the first importance, not only on account of its large hospital, but also as being the headquarters of No. 3 section Line of Communications, of which district I was field inspector during the expedition. In yet another respect this station became prominent, as it was from it the entire expeditionary force begun the return march and river journey. It devolved on me to make all the necessary medical arrangements for the various regiments passing through my section, which extended about 151 miles along the Nile. The following brief notes may be of some little interest.

ABSTRACT OF HOSPITAL ADMINISTRATION FOR THE FIVE MONTHS  
ENDING 25TH MAY, 1885.

When I assumed charge of this hospital on the 24th December 1884, it was then on a small scale, capable of accommodating about 40 patients, this being ample for the wants of the troops passing up the river to Korti. On the 1st February a telegram came from the chief of the staff ordering the hospital to be increased to 120 beds; shortly afterwards another telegram came, directing us to enlarge the hospital to 200 beds.

Hut building was now vigorously prosecuted. Each hut was 22 ft.  $\times$  16 ft.  $\times$  9 ft., the walls and roof were made of stout matting of *dhoura* straw (the Indian *jowarr*); there was a door at either end, with a movable mat cover; the doors and porous walls ensured perfect ventilation. The roof consisted of a double matting, and as the weather became hot I had the interior of each roof covered with blankets, this to a great extent moderated the fierce rays of the sun. Hospital building.

The huts for sick officers, and those for enteric cases, had in addition a verandah of matting all around, put on crinoline-fashion. There were 14 huts in all, each hut held 10 or 12 sick, so with several marquees and European Privates tents we had abundant room.

These huts answered our purpose admirably; they were cool, clean, well-ventilated, in every sense antiseptic, the *dhoura* matting did not harbour disease germs in the smallest degree; and to this fact, *plus* the pure air of the Desert, I attribute the highly satisfactory result, that all the septic or hospital diseases were absolutely unknown at Abu Fatma, even with numbers of patients with suppurating wounds.

The huts were provided with charpoys purchased in the surrounding villages. We were well supplied with mosquito curtains. However, the sick, as a general rule, preferred a square piece of green muslin net to throw over their faces. Each patient had a fly-whisk. By means of empty biscuit cases and tin boxes, I improvised a variety of bedside articles, viz., tin covers for mugs and plates, to keep dust and flies out; cupboards, back-rests for sitting up cases, feeding trays, commodes, small tables, &c., &c. These articles were a great comfort to the patients, and were highly approved of. To make the huts cheerful and inspiring, I had a number of lively pictures from the illustrated papers hung all around the walls. I may add that the floors of the huts were kept scrupulously clean, and from sunset till nine p.m. each hut was lighted by a lamp. Hut equipment.

Taking climate, scarcity of cattle, and other circumstances into consideration, the quality of the meat was as good as could be expected; mutton being more tender and more juicy than the beef, the former was kept for special cases Food and cooking.

The beef made fairly good, certainly very wholesome stews,\* with rice and vegetables. The bread, though not very white, was, on the whole, good wholesome campaigning bread.

Tinned articles.

We had a well-maintained supply of tinned provisions, such as milk, cocoa and milk, bacon, jams, brandy, champagne, Bass's beer, wine, &c., &c.

Cooking.

This was done by two trained certificated cooks and an assistant, and we had a good oven made of Nile mud.

After a short stay at Fatma both officers and men acquired most vigorous appetites†.

Fruit and vegetables.

These essentials were plentifully supplied from the Commandant's garden. I need hardly say that the sick and wounded, who had seen no fresh vegetables, except onions occasionally, for some previous months, were benefited in their health by a variety of the best vegetables grown from English seeds. Mustard, cress, spinach, lettuces, radishes, carrots, peas, tomatoes, and melons arrived in basketsful every day at the hospital, and were the greatest boon and treat to the patients, given, of course, to the suitable cases. I attribute the non-appearance of a scorbutic taint at Abu Fatma to the abundance of vegetables, as the Marine Board Report, 1883, states that lime-juice alone is not reliable as an anti-scorbutic.

Scavenging and water supply.

The dry earth system was rigidly carried out, though the difficulties in native labour were at times very great, as even with high pay the natives frequently absented themselves in a body. The weakly men were provided with commodos I had improvised, and so were saved the exertion of walking to the latrines, which were dug some distance to leeward of the huts.

The Nile supplied us with water, and it was taken from the river some distance from the bank. I obtained from Korti a sufficient supply of Nile-boat filters to enable me to place one in each hut; these filters were kept scrupulously clean, and there was an ample supply of drinking water in each hut.

Recreation room.

I devoted one large hut especially as a reading and recreation room. It was fitted with tables and chairs, and two Nile-boat filters. Newspapers were abundantly supplied by the Red Cross Society, and from private friends of my own in England. The walls of this hut were covered with amusing or interesting pictures; cards, backgammon, and dominoes were available, and this hut was specially well lighted every evening up to 9.30. I may add that the chairs and tables were all made out of empty biscuit boxes.

General health of patients.

Abu Fatma enjoying the purest desert air, there was a marked improvement in the general health of all the sick and wounded after they had been a short time with us, even the most desperate cases struggled hard to rally. Ophthalmia was unknown, and there were only seven cases of sunstroke, though this disease might have been expected, owing to the oppressive heat; the shade temperature often running up to 120°; 116° was common.

Danger from fire.

As from the nature of the ground the huts had to be built in close proximity, it was imperatively necessary that the rules against careless smoking should be stringently enforced. The huts were watched closely day and night, the patients were encouraged to smoke in the reading room, all helpless cases were kept near the doors, and were carried outside the huts at night. Extra openings were cut in the side walls of the huts. This gave four means of escape from each hut, but it was to a great extent owing to the good conduct and steadiness of the non-commissioned officers and privates Medical Staff Corps attached to the hospital that we escaped fires.

This risk of fires was a great source of anxiety to me; with a number of helpless cases many lives would have been lost had a fire occurred, as, owing to their very inflammable nature, huts were completely burned down in about five minutes.‡

\* I am convinced that, in preparing meat for sick or rather convalescents, the two great drawbacks on a campaign are want of cooking fat or oil, and want of some good relishing sauce. The reasons are so patent I need not mention them. Why not carry these things? Chickens, eggs, and milk (fresh) were sometimes scarce, but the supply for such a large hospital was, on the whole, fairly kept up; no effort was spared by the Commissariat.

† It would be an immense advantage if good portable cooking stoves, or American kitcheners, also good mincing machines, were available for large hospitals as near the front as transport may allow.

‡ Four fires occurred at the camp Abu Fatma, one at Dongola, one at Hafir, one at Kaboddy, the two latter places are a short distance from Abu Fatma.

I therefore feel thankful now that I am giving over charge of the hospital—military operations being at an end, and hospital work practically finished, only a few patients remaining—that, although fires were very numerous all around us, Abu Fatma hospital escaped.

TABLE showing total admissions, deaths, invalided, discharged, and remaining for the five months ending 25th May, 1885.

—	Officers.	Non-commissioned Officers and Privates.	Total.
Admitted - - -	83	931	1014
Discharged - - -	13	350	363
Invalided - - -	66	524	590
Died - - -	3	25	28
Remaining - - -	8	35	38

TABLE showing the mortality, &c. from the chief diseases.

—	Enteric.	S. C. Fever.	Dysentery.	Wounds.	Pneu- monia.	Heptitis.	Sun- stroke.
Admitted - -	164	134	119	129	5	4	7
Died - - -	15	2	3	2	1	1	1
Invalided and re- covered	149	132	116	127	4	3	6

Many Egyptian soldiers, Canadian voyagers, kroomen, shieks and villagers from the neighbouring districts received medical treatment; we had a special hut for the use of natives suffering from small-pox.

#### ABSTRACT OF LINE OF COMMUNICATION DUTIES FROM ABU FATMA.

My work as senior medical officer at Abu Fatma was combined with line of communication duties in No. 3 section, of which I was field inspector. My district extended from Dongola to Tanjour, and as the river fell in the summer from Abu Fatma to Sarkamatto.\*

The principal duty of my district was to despatch suitable convoys of invalids down the river to Wady Halfa, and to provide for all their medical wants on this long river journey. The small rest hospitals in my district† were so placed as to cataracts and position that they were convenient for the reception of passing severe cases, should any be dropped by the different boats.

In water transport of invalids, two classes of boats were employed, viz., “nuggers” and “whalers.” The “nuggers” were large, almost flat-bottomed native boats, somewhat like lighters, with a very tall mast. All the boats sailed from Kaboddy (at the north end of the Fatma cataract), and the fitting out of these “nuggers” at Kaboddy, in consultation with the Commandant of Abu Fatma, required early attention. Each of these boats was intended to carry about 25 sick, and it was necessary to provide them with

Line of communication duties.

Nile transport.

\* On the return march at the very end of the expedition to wind up work, No. 3 section L. of C. was merged in No. 2 section L. of C.

† At first including Dongola, Kybar, Absurat, Sarkamatto, Akasheh, Ambigol Tanjour. Latterly as river fell, Kybar, Absarat, Koyematto, Amara.

bedsteads (charpoys), filters, cooking-places, awnings, and everything necessary for the use of the sick and wounded.

These "nuggers" continued running up to the middle of March, when, owing to strong north adverse winds and the rapidly falling river, they had to be given up. The last of them left Kaboddy on the 2nd March, and from the 11th February, when they commenced to run, we were only able to despatch northwards in the boats 13 officers and 75 men.

Whalers were now our only means of water transport, and they answered the purpose admirably. Six or seven "sitting-up" cases, or two "stretcher cases" with two "sitting-up" cases, formed a boat-load. Six Egyptians or Dongolese formed the crew, and there was a man of the Medical Staff Corps or an English soldier in each boat to attend on serious cases.

There were generally six to eight boats in a convoy, in charge of a surgeon and two or three Medical Staff Corps or fatigue men to assist.

Having selected the suitable cases, the convoy was despatched from Abu Fatma hospital in the following manner:—All serious cases were carried on stretchers by Egyptian soldiers; camels and mules carried all the less serious cases which were fit to ride. After sunset, when the heat was less oppressively felt, the party set out for Kaboddy, where the river journey began; there were tents here for the party to sleep in, and shady trees by the river-bank. In the early morning, after the party had tea, bread, cocoa and milk, they were placed in the boats, their kits, arms, provisions, and all medical requisites, having been first placed on board; an abundance of medical comforts were carried. The convoy now set out on its long Nile journey, all the boats keeping up a close communication. About 1 p.m. the convoy hauled up to the bank, selecting a shady place, if possible. Here fires were lighted, and a warm meal prepared and issued, patients attended to, wounds seen to, &c. About 6 p.m. the convoy reached Kybar, where there was a rest camp, in which they passed the night, embarking and journeying on, in like manner day by day, sleeping at night on the bank, should there be no rest camp near. When Akashey was reached they were out of my district. Now they began their land journey to railhead.

The serious cases were provided with lying-down accommodation on stretchers, made as comfortable as possible with air-pillows, folded blankets, mattresses, bolsters, &c. Two of the most serious cases (officers) were never lifted from their beds, but were placed, beds and all, in the boats. Each boat was provided with an awning, and by means of helmet curtains, spine shields, and umbrellas every possible precaution was taken to ensure the safety and comfort of the invalids proceeding from Abu Fatma.

According to the nature of their cases, the invalids were carried on stretchers or rode across the various portages. Telegraphic communication was well kept up by the various commanding officers of stations; the organisation was excellent; and so everything connected with this most difficult and anxious duty worked well, specially the medical officers and Medical Staff Corps. Up to date, 35 convoys of invalids, numbering 89 officers and 941 men, have been passed from Abu Fatma through my section. L. of C. expeditiously, without any mishaps, and with the least possible discomfort, to the above large body of sick, many of whom were exceedingly debilitated from wounds and sickness contracted in the effort to rescue General Gordon.

The various regiments went either by boat or by road march from Abu Fatma. The journey in the hottest month of the year was very trying. Special sanitary arrangements at the various halting places were made; hot cocoa and milk was served out at the midnight halting place, the troops began their march at sundown, halting about 12 or 1 o'clock, and reaching their new ground early next morning, and resting there all day. They marched along the river-bank, boats and rest hospitals were always available for emergent cases. Each party had a surgeon and panniers or field companions. As none but healthy men were allowed to march, only a very few fell out on the return journey down the Nile.

The various hospitals in my district were arranged for the reception of all serious cases occurring either among the troops passing up the river, or for cases happening on the return journey, where invalids from convoys required rest and quiet before continuing their journey. These hospitals were also available for any cases dropped by returning parties of troops on the return of

Voyage of a convoy of sick.

Special arrangement for invalids.

Crossing portages.

Return of the Nile Expedition.

Hospitals, medical officers, and M.S.C.

the expedition. The hospital at Sarkamatto was arranged for 70 sick, the other hospitals varied from 50 to 20 beds; a medical officer and a small staff Medical Staff Corps were posted at each. Two supplementary hospitals were placed at Koyeh Matto and Abri for the return expedition. These hospitals worked well, and were the greatest possible credit to the medical officers in charge, especially may I mention Absarat, under Surgeon Boyd, and Kybar, under Surgeon Powell. The hospital at Koyeh Matto, under Surgeon Allin (now Surgeon-Major), though fortunately not required, was everything that could be desired. The difficulties in arranging and fitting these hospitals were enormous, and the work most arduous for all concerned.

The duty of the various medical officers and medical staff corps attendants in convoy work was a most difficult and trying one, full of hardship and anxiety by day and by night. Indeed, it was to the untiring energy of the above officers and men that the success in transporting the vast number of invalids through No. 3 section Line of Communication was to be attributed; the painstaking services of Surgeon Gormsby, Sergeants Case, Vincent, and Corporal Franks, M.S.C., were highly commendable throughout.

The conduct of the medical staff corps was excellent. Though native spirit could be purchased, there was no drunkenness, and only a few minor offences. Their duties, especially at Abu Fatma, working through the long trying summer months, were of a most arduous and difficult kind. The high rate of mortality and invaliding among officers and men speaks for itself. Four medical officers were invalided from the working at Abu Fatma; two surgeons\* and seven orderlies died at their post, and are buried at this station, victims to hardship and exposure in the climate of the Soudan.

---

\* Surgeon Leslie and Surgeon Stace.



## APPENDIX No. XVI.

## A BRIEF SURVEY OF THE EFFECTS OF HIGH TEMPERATURE ON THE BODY, WITH SPECIAL REFERENCE TO THE NATURE, PREVENTION, AND TREATMENT OF HEAT-STROKE.

---

By Surgeon M. R. RYAN, M.D., Medical Staff.

---

SUBMITTED in accordance with Paragraph 4, Appendix No. 1, Medical Regulations.

The various effects of prolonged exposure to high temperature on the human body have been very imperfectly worked out. The observations on the subject are fragmentary, disconnected, and in many instances contradictory. It is possible, however, to glean from a mass of loose and imperfectly supported statements certain facts of interest and suggestiveness. These I shall endeavour to record; but in a paper like the present, written in fulfilment of a condition imposed by regulation, the subject, which is a very complex one, can only be treated in a brief and tentative manner, and chiefly from the standpoint of practical clinical experience.

As it is almost impossible to determine the part which heat alone plays in the causation of certain tropical maladies, associated as it usually is with so many other prejudicial agencies, malaria, insanitation, injurious habits of life, &c., I shall confine my remarks to those conditions which are more obviously the result of high external temperature.

It will be convenient to consider the subject under the following heads:—

*Section 1.*—Physiological effects of heat on the tissues and functions of the body.

*Section 2.*—Circumstances influencing individual susceptibility to heat.

*Section 3.*—Clinical, (a) slighter effects of heat, (b) heat-stroke.

*Section 4.*—Prevention and treatment.

## SECTION I.

## PHYSIOLOGICAL EFFECTS OF HEAT.

*Effects on Protoplasmic Movements.*

Heat at first greatly quickens the movements of amæbæ. If, however, it be raised to about 35° Cent. it causes them to fall into a state of tetanic contraction, in which they assume a spherical form. This state is known as *heat tetanus*. If the temperature be reduced the amæboid movements will re-appear. At a temperature of 40° Cent. amæbæ enter into a state of heat rigor (*rigor caloris*), the heat having coagulated the albumen, and their movements cannot be restored (Lander Brunton). It is probable that the protoplasmic elements of muscles are affected in a similar manner.

*Effects on Muscles.*

The excitability of muscles is increased by heat and diminished by cold. Heat renders contraction quicker, higher, and shorter, and increases the rapidity of the conduction of the contraction wave. Heat causes the isolated non-striated muscles of animals to contract.\* It appears that many, if not

---

\* Pluſger's Archives, Bd. 26, p. 465 (quoted by Brunton).

most, muscular poisons act more quickly with increased temperature. (Brunton.) According to Kühne (quoted by Parkes), the muscular myosin begins to coagulate at 113° Fahr.

#### *Effects on the Circulation.*

Heat acts as a powerful cardiac stimulant, increasing the power and rapidity of the heart's action. (Alex. Von Humboldt.) A long, continued high temperature, however, makes the heart irregular, and finally stops its beat. Heat also acts as a *vascular stimulant* by dilating the vessels and thus rendering the flow of blood through them more easy and rapid. (Brunton.) The average pulse rate, however, according to Rattray (quoted by Parkes), is lower in the tropics than in the temperate zone by  $2\frac{1}{2}$  beats per minute.\*

#### *Effects on the Respiration.*

Heat acts as a stimulant to respiration by augmenting the activity of the respiratory centre. The respirations become quicker, deeper, and more respiratory work is done. (Brunton.)

On the other hand, Parkes quotes the authority of Vierordt and Ludwig for the statement, that the respirations are lessened in number in animals subjected to heat, and Rattray's observations on men support this view. The spirometric measurement of expired air (representing the "vital capacity" of Hutchinson) increases, according to Rattray, in the tropics; but notwithstanding this, the effect of the lessened number of respirations is to reduce the whole of the respiratory work considerably. It seems difficult to reconcile these apparently contradictory statements. The observations of Parkes and Francis, that the lungs are lighter after death in Europeans in India than the European standard, would go to support the belief that the respiratory function is diminished.

Putting aside the alleged effect of heat in accelerating the respiratory centre, it appears to me that on theoretical grounds, at any rate, we might conclude there is an *increase* of respiratory action, or, more properly speaking, of *respiratory movements*, in the heated atmosphere. In proportion to the degree of rarefaction of the atmosphere by heat, the absolute amount of oxygen in a given volume of inspired air must, of course, be diminished.† Assuming then the need of the system for oxygen to remain the same in a hot as in a cold atmosphere, the fact would involve the necessity of increased respiratory action to enable the system to obtain the requisite quantity of oxygen from the heated atmosphere. We ought not, however, perhaps, too hastily assume that the need of the system for oxygen is the same under both circumstances. Apart from the lessened activity of the functions generally, the fact that the work of maintaining the animal heat must be considerably diminished in a heated atmosphere would point to a lessened absorption of oxygen.

It is not improbable that the apparent discrepancy between the effects of heat on the respiratory function of man under ordinary circumstances, and its effects when applied experimentally to the same function in animals, may be accounted for by difference in the conditions as regards degree of heat, suddenness or slowness of application, length of exposure, and other circumstances, which may readily suggest themselves. Finally, it may well be conjectured that the total respiratory work is materially reduced by the comparative inactivity of the life led by most individuals in the tropics. There is, no doubt, as will be seen hereafter when treating of heat-stroke, that one of the effects of excessive heat, especially exposure to the direct rays of the sun, is to produce rapid exhaustion or paralysis of the respiratory centre, so leading to asphyxia by arrest of the respiratory movements.

\* Being unable to refer to the original authority, I am not acquainted with the character or extent of the observations on which this statement is founded, but I am disposed to doubt its general accuracy. I have always found the pulse rate increased by exposure to high temperature in healthy men. No doubt, the comparative inactivity of the life led by most individuals in the tropics would tend to reduce the aggregate of the cardiac contractions.

† The diminution is greater as the air approaches saturation. Thus a cubic foot of dry air at 32° F. contains 130 grains of O and at 80° F. 118·17 grains, while a cubic foot of air saturated with moisture contains 130 grains of O at 32° F. and 112 grains at 100° F.—(Parkes.)

*Effects on the Blood.*

Extreme heat by its action on the red corpuscles renders the blood dark, as if deprived of oxygen. The blood assumes the *lake* or transparent appearance, indicative of complete and hopeless destruction of the red corpuscles—the hæmoglobin has left the corpuscles and is dissolved in the plasma. (D. Mitchell Bruce.) It is to be regretted that the exact degree of heat at which these occurrences take place has not been stated.

*Effect on Nerve Currents.*

In experiments on frogs, when a temperature much over the natural amount is applied to nerves, the electrical currents through them are lessened, and finally arrested.\*

*Effect on the Skin.*

Heat, as is well known, greatly stimulates the action of the skin. The immediate effect, however, of exposure of the skin to high temperature is apparently to arrest perspiration. This may be the result of rapid evaporation of the water of perspiration, of a direct influence on the peripheral fibres of the nerves presiding over the secretion of the skin, or a reflex inhibitory influence on the sweat centre. The importance of this influence, as it affects the heat regulating mechanism, will be alluded to further on.

*Effect on the Kidneys.*

When the body is exposed to high temperature the urine becomes more concentrated, and contains a relatively large amount of solids. Whether the absolute amount of solids, colouring matter, urea, &c. is increased or diminished has not been accurately determined.

*Effect on the Liver.*

The effect of heat alone on the liver and its secretion has not been precisely ascertained. Its effect when combined with inactivity and too much food or stimulants is being daily demonstrated in the tropics. The familiar example of the fatty degeneration produced in the livers of Strasburg geese by exposure to a hot, moist atmosphere and excessive feeding may, doubtless, serve as an illustration of what takes place in man under similar conditions. The lessened absorption of oxygen, or the lessened need of combustion for the maintenance of animal heat in a hot atmosphere (probably both), is supposed to give rise to the accumulation of calorific material in the liver. Hence, according to some, the gradual enlargement which the organ so commonly undergoes in the tropics. How far the enlargement is dependent on the effects of heat *per se*, and how far on the habits of the individual with regard to food, drink, and exercise, it is not always easy to determine. It may be taken as certain, however, that, even among the most careful and temperate people, the liver is far more liable to functional and other derangements in hot than in cold or temperate climates.

*Effects on Tissue Metabolism.*

Heat diminishes, cold increases the metabolism of the tissues, especially the muscular. "A lowering of the temperature of the skin leads to an increase, while a heightening of the temperature of the skin leads to a decrease of the "muscular metabolism." (M. Foster.) As the muscular metabolism is, as will be presently pointed out, the chief source of animal heat, these effects must be regarded as strictly conservative in relation to the maintenance of the proper degree of animal heat under varying conditions of external temperature.

---

\* Eckhard and E. H. Webber (quoted by Parkes).

*Effects on the Heat Regulating Mechanism.*

It is still a disputed question whether the temperature of the body is permanently raised in hot climates. The consensus of opinion among different observers seems in favour of a slight increase. My experience, derived from a considerable number of observations on healthy men in India, does not agree with this. It was found that the temperature of the body was always more or less increased (from  $5^{\circ}$  to  $1.5^{\circ}$  deg. Fahr.) by exposure to great heat, but when the influence of the great heat had been withdrawn, there was almost always a corresponding depression. Thus it was frequently observed that during the comparatively cool nights following excessively hot days at certain seasons of the year in the Punjab, the temperature in healthy men became distinctly sub-normal.

The influence of high external temperature as its effects the equilibrium between heat production and heat elimination is of great importance in its bearing on the mode of production of heat-stroke.

It will be well, in the first place, to refer briefly to the physiological mechanism by means of which the heat of the body is maintained and regulated. The views on this subject have of late undergone considerable modification. It is now generally held that the heat of the body is not generated by the oxidation of any particular substance, but of the tissues at large.

"Wherever metabolism of protoplasm is going on, heat is being set free." (Foster.) *The muscles on account of the large relative proportion they bear to the other tissues of the body, and the peculiarly active character of their metabolism, must be regarded as the chief sources of heat.* "They are *par excellence* the thermogenic tissues." (Foster), though the various secreting glands, notably the liver, the brain, blood, and to some extent the indifferent tissues, are severally sources of heat. The practical bearing on the causation of heat-stroke of the highly important fact that the muscular metabolism is the chief source of body heat, will be referred to hereafter.

A certain definite proportion of the heat generated in the body is, under ordinary circumstances, being continually eliminated by radiation, conduction, and evaporation. The heat used up in warming the expired air, the faeces, and the urine, and in the evaporation of the water of respiration, is of course lost to the body. The skin, however, is the great regulator of heat loss. From the cutaneous surface heat is lost by conduction and radiation, and especially by evaporation of the water of perspiration. It is also highly probable that heat is absorbed or rendered latent in the integration or building up of tissue, and when this integration is checked or retarded, the heat, which would otherwise be used up, accumulates in the system. This view, which has been ingeniously advanced by Dr. Ord in explanation of the heat of fever,\* is supported by Dr. M. Foster ("Physiology" p.461) who says, "In the constructive metabolism of the body heat may be undoubtedly to a certain extent absorbed or rendered latent, the energy of the construction may be in part, at least, supplied by the heat present."

The balance between heat production and heat elimination is under favourable conditions accurately adjusted, and the body maintained at a singularly uniform temperature. It is now pretty clearly established that both the production and elimination of heat are under the control of the nervous system. There is satisfactory experimental evidence of the existence of a thermogenic nervous mechanism (the centre for which has, with some show of probability, been placed above the medulla in the region of the *Pons Varolii*) by which afferent impulses arising in the skin or elsewhere originate through this centre, afferent impulses which increase or diminish the metabolism of the tissues chiefly concerned in the production of heat, and thus increase or diminish the amount of heat generated for the time being in the body. It has already been mentioned that "a lowering of the temperature of the skin leads to an increase, while a heightening of the temperature of the skin leads to a decrease of the muscular metabolism, which, as we have seen, is the chief source of animal heat. One effect, then, of heat to the surface is to check the production of internal heat, a beautifully conservative effect. The influence of the nervous system in the regulation of heat, is, however, probably chiefly

\* Opening Address to the Medical Society of London, "On the Heat of Fever," October 17th, 1885. (British Medical Journal.)

manifested in its action on the secretion of the skin. The existence of special nerves directly governing the secretion of the sudoripaceous glands, independent of variations in the vascular supply, has received direct experimental support. These special nerves of perspiration act as regulators of temperature, increasing the loss of heat when they promote, and lessening the loss when they cease to promote the secretion of the skin." (Foster.)

Experiments on animals appear to prove that, in the absence of this nervous influence, rise of external temperature, will not give rise to secretory activity of the sweat glands.

It will thus be evident that high external temperature may derange the normal body heat in several ways:

(1.) By interference with the elimination of heat by conduction and evaporation.

No heat can, of course, be lost when, for example, the temperature of the air inhaled is as high or higher than that of the body. The effect on evaporation from the skin is, however, perhaps the most important. Evaporation goes on rapidly in a hot, dry atmosphere, but is retarded or checked in proportion to the degree in which the air is loaded with moisture. Hence the more frequent accumulation of body heat leading to heat-stroke in a hot, moist atmosphere.

(2.) By interference with nervous mechanism concerned in promoting the secretion of the skin, either through a reflex influence on the sweat centre, or by directly paralysing the nervous filaments governing the secretion of the sweat glands.

(3.) By checking or retarding the integration of tissue and so leading to accumulation of the heat supposed to be absorbed or rendered latent in the processes of healthy nutrition.

(4.) By directly imparting heat to the body. This could readily be done in cold-blooded animals which seem to have no heat-regulating mechanism, but could only occur to any extent in warm-blooded animals and man when the external heat was so excessive as to overpower the regulating mechanism. When from any cause the regulating mechanism is out of order, as it presumably is in all febrile affections, the temperature of the body can be rapidly raised until death ensues. Experiments on animals go to prove that death takes place when the temperature of the body is raised by 6° or 7° Centigrade. There is at present no very clear explanation of the cause of death under such circumstances. It has been suggested that the muscles enter into a state of *rigor caloris*, but it appears that animals frequently succumb before this takes place. A high temperature, as we have already seen, makes the heart irregular, and finally stops its beat; but probably other tissues are also injuriously affected, so that death cannot be attributed to the stoppage of the heart alone. (Foster). In all probability the respiration is affected to an equal, if not a greater extent than the circulation.

It is obvious that if, from any cause, the amount of heat generated in the body is increased, as it probably is in fevers, the embarrassment of the heat-regulating mechanism will be much increased in presence of high external temperature.

The foregoing are the chief functions of the body that are influenced by heat. What effect prolonged exposure to high temperature stopping short of the production of dangerous symptoms, has on the nutrition and well-being of the system as a whole, it is extremely difficult to decide, in view of the fact already noticed, that there are usually so many other deleterious influences at work in tropical climates where alone persons are exposed for any time to excessive heat. It seems probable, however, that the general effect is in unacclimatised persons, to somewhat seriously interfere with the processes of healthy nutrition and elimination, and so predispose to the occurrence of organic and functional disturbances of various kinds.

It is a matter of pretty common observation that the normal balance of nutrition among Europeans is seldom maintained for any length of time during exposure to high temperature. Individuals ordinarily either gain or lose weight. In the former case the increase in the vast majority of instances is due to an increase of adipose tissue, which in itself may be taken as an evidence of malnutrition. I have the weights of two healthy officers taken

every week for a number of years in India. There is always a very appreciable loss during the hot weather, and a rapid gain on the advent of the cold. Of course many Europeans appear to enjoy perfect health in very hot countries. Such persons, however, are always in the minority, and their condition of seeming vigour is often more apparent than real. The illusion is only too frequently dispelled on their return to cold or temperate climates.

## SECTION II.

### CIRCUMSTANCES INFLUENCING INDIVIDUAL SUSCEPTIBILITY TO HEAT.

The circumstances which influence susceptibility to heat, so far as these depend on the habits of the individual, have been so often pointed out and insisted upon that in this place they need little more than enumeration. Thus intemperance, dissipation, overwork, anxiety, overcrowding, and other depressing influences, unsuitable or oppressive clothing and accoutrements, deprivation of food or water, are all conditions which are well known to predispose to the severer effects of heat. There are some, however, whose influence in this direction is not so fully recognised, which may be referred to with advantage.

*A febrile condition of the system* from whatever cause arising greatly lessens the power of resistance to high external temperature. This fact, which is *a priori* probable, is abundantly borne out by experience. It will be referred to again in connexion with heat-stroke.

The influence of *malaria* as a predisposing condition is denied by some, but it is of undoubted importance in two respects—(1) in its liability to give rise to febrile disturbance; (2) in its tendency to impair the general health, producing, even in the absence of fever, the well-known malarial cachexia (*Cachexie Palustre*), which greatly impairs the power of the individual to resist high external temperature. In the same way insanitary conditions generally tend to diminish the individual power of resistance.

*Violent and long continued muscular exertion*, which, as may be inferred from the physiological considerations mentioned in the last section, is a powerful generator of body heat, predisposes strongly to the ill-effects which follow from exposure to high temperature. Many examples of this fact were recorded long before the influence of muscular metabolism on animal heat was fully recognised. Indeed, the degree of muscular development would seem very definitely to influence individual susceptibility to the pyrexial forms of heat-stroke. It was a common observation at Suakin during the hot weather of 1885, that the worst cases of heat-stroke attended by very high temperature occurred among some of the most robust and muscular men in the European force.

The influence of so-called *acclimatisation* is not very easy to determine. It is a well-known fact that the natives of tropical climates, though by no means exempt from the severer effects of heat, exhibit a wonderful tolerance of the direct rays of the sun. This has doubtless been acquired in the course of many thousand generations, and it would be indeed rash to assume that in the course of a single life a tithe of such tolerance could be acquired. New-comers would appear, however, as a rule to be more liable to suffer from the severer effects of heat than those whose systems have had some time to adapt themselves to the conditions of life in a hot climate. On the other hand, long residence in a hot climate does not seem to confer any real immunity on the European constitution. Thus it is a common remark of those who have lived some time in the tropics, that they feel the heat more and more every year, and are less able to bear exposure to the sun. This doubtless arises from progressive deterioration of the constitution, more particularly of the nervous system. Healthy young officers in India commonly declare that they experience little or no discomfort from the heat during the first few years. The same cannot be said of young private soldiers, who, under similar circumstances, are liable to suffer severely. The difference in habits and conditions of life, apart from difference in stamina, may be held to account for the difference in this respect between the two classes of young men.

An attack of *heat-stroke* renders the individual for a long time peculiarly intolerant of high temperature. I have known patients invalided for the affection from India who were unable to bear exposure even to the direct rays of an April sun in England. This hyper-susceptibility sometimes lasts throughout life, and is of course a serious, if not insuperable bar to service in the tropics.

*Persons of feeble cardiac power*, especially those who are the subjects of *fatty degeneration of the heart*, stand heat very badly. They are liable to a fatal form of exhaustion, which will be referred to later on. Even where the symptoms do not immediately threaten life, the cardiac weakness is always, in my experience, aggravated by residence in a hot climate.

### SECTION III.

#### CLINICAL.

(a.) *Slighter Effects of Heat.*

(b.) *Heat-stroke.*

It will be well to consider first the symptoms caused by heat which do not ordinarily threaten life.

(a.) *Exhaustion*, nervous or cardiac, or both, is a very common effect of prolonged exposure to high temperature. A sudden and dangerous form of exhaustion produced by exposure to the direct rays of the sun will be referred to under the head of *Heat-stroke*. The form of exhaustion with which we are now concerned comes on more or less gradually. There are usually symptoms both of nervous and cardiac failure, but either may predominate in individual cases.

*Nervous exhaustion* is manifested in general impairment of nervous power and tone. Patients exhibit an irritable, emotional or semi-hysterical condition which is in some respects peculiar. There is a relaxation of mental and bodily vigour. Trivial causes occasion excitement. Despondency, homesickness (especially in the young), or settled gloom frequently obtain the mastery over the individual, who is prone to seek relief in stimulants, which inevitably aggravate his symptoms. Not infrequently a suicidal tendency manifests itself. The mental condition in these cases is often pitiable. The symptoms are, perhaps, more common among officers or persons of higher intellectual development than among soldiers. When an hereditary tendency to insanity exists it is very commonly evoked under the conditions of life in a hot climate.

*Heart exhaustion* exhibited in weakness, irregularity, and undue excitement of the heart's action, with a tendency to fainting fits, is very common. Individuals the subject of cardiac weakness, or fatty degeneration, as mentioned in Section 2, bear exposure to great heat very badly. I have more than once witnessed cases of progressive and ultimately fatal exhaustion in individuals in whom the latter condition was suspected to exist.

#### *Heat Fever.*

A febrile affection of continued type and of usually brief but uncertain duration has long been recognised as an effect of high external temperature by those conversant with tropical maladies. It has received such names as thermal, ardent, sun fever. It presents nothing very peculiar beyond febrile movement of more or less intensity lasting from one or two to several days. The subjects are frequently robust and full-blooded young men given to over-indulgence in food or stimulants. The tongue is, as a rule, heavily coated, the pulse full and bounding. There is often intense throbbing, headache, and frequently some evidence of gastric or hepatic disturbance.

Quinine has little or no controlling effect, and often, indeed, seems only to aggravate the fever and general discomfort. Under simple palliative treatment the affection ends favourably; but like other febrile conditions, it may powerfully predispose to attacks of *heat-stroke*, and patients affected with it

should be most carefully watched, especially during hot, still nights, with a view to the prompt employment of anti-pyretic measures should the temperature show a disposition to rise to a dangerous degree.

#### *Heat Delirium.*

Delirium of a more or less pronounced kind is a not infrequent symptom during recovery from insensibility in severe cases of heat-stroke. But there is a form of delirium occurring independently, in persons exposed to high temperature, which might, I think, be not inaptly termed *heat delirium*. A person, perhaps of rather intemperate habits, while exposed for some days to continuous high temperature, is observed to be out of sorts, or perhaps "queer" in his manner." Suddenly some trivial occurrence gives rise to great excitement, the patient's demeanour becomes loud and boisterous, he uses profane language, quarrels with his comrades on the most trivial pretext, and perhaps makes an attempt on his own or somebody else's life. I have seen cases of this kind which could not, at any rate, be attributed to the *immediate* effects of drink. The condition is hardly distinguishable from ordinary acute maniacal excitement, except that the temperature is generally higher, being commonly from 103 to 105 degrees, or even more. The fever and mental excitement are of short duration, and readily yield to anti-pyretic treatment. The patient so treated often sinks into a deep sleep, and wakes up calm and collected. Again (I refer to experience among soldiers), a man lies down to sleep in a hot atmosphere feeling feverish, perhaps, and out of sorts. He is accidentally roused, jumps up suddenly, evinces a combative tendency, and for some minutes talks wildly and incoherently. A cold douche readily brings him to his senses, and after its operation he usually sinks into a quiet sleep. No doubt in many such cases *alcohol* is an important element, but they certainly cannot, as I have already remarked, always be attributed to its immediate effects, as I have known such attacks occur in men who had "knocked off their liquor" for some time.

#### *Aphasia.*

It may be worth recording that I have seen a few cases of temporary aphasia in men during exposure to high temperature. A notable example was the case of a non-commissioned officer who presented himself one morning at Suakin to the medical officer in charge of his battery, in great alarm, unable to utter a word, though he could to some extent express his ideas in writing. The man was known to be temperate, and was apparently quite healthy. The heat at the time might without exaggeration be described as terrific, the thermometer in the men's tents registering 120° F. in a still, humid atmosphere. Cold applications to the head were ordered. The aphasia disappeared entirely in a few hours, and the man regained his normal condition. In the absence of any other obvious cause, the attack was attributed to the great heat; how far rightly I cannot undertake to say. I have since then seen two other cases of temporary aphasia, not, however, so marked, one occurring in a Government labourer apparently from exposure to a hot sun in England. It is possible that great heat may cause a temporary *functional* disturbance of the centre of articulate speech (for such I presume to be the condition in the cases just alluded to), but it would of course be absurd to draw any definite conclusion from such slender data.

The foregoing remarks deal only with the more prominent and interesting of the minor effects of heat, and do not of course exhaust the catalogue.

#### (b.) *Heat-stroke.*

The classification of the severer effects of heat adopted in the latest edition of the "Nomenclature of Diseases," though somewhat of an improvement on that which it has superseded, is still open to very considerable objection.

The division of heat-stroke into (a) sun-stroke, (b) heat apoplexy, is clumsy, to say the least of it.

Regarded from the point of view of its derivation ( $\alpha\pi\sigma$ , from, and  $\pi\lambda\eta\gamma\iota\varsigma$ , a striking), or from that of its conventional meaning, the term apoplexy is alike



objectionable, If meant merely to express a *stroke*, the English word is preferable; and if taken in its usual sense (unqualified by the adjective congestive, &c.), it implies a condition, viz., hæmorrhage (e.g., cerebral, pulmonary, splenic apoplexy), which certainly plays no part in the vast majority of the cases to which in the present connexion it is applied.

It would probably give rise to less confusion were some such classification as the following adopted:—

Heat-stroke—(a) Solar, from the direct rays of the sun;

(b) Asolar, occurring away from the direct rays of the sun.

Such a classification is, of course, justified more with a view to indicating the mode of causation than as implying any essential difference between the cases. There is, however, as will be observed presently, at least some *clinical* difference between the cases arising from direct exposure to the sun and those occurring under other circumstances.

Cases of heat-stroke have been divided by writers into varieties according to the relative prominence of certain symptoms. Such division is, I think, entirely arbitrary, and not justified to any extent by the phenomena commonly observed. Thus there is, in my experience, no real ground for separately describing asphyxial, syncopal, and hyperpyrexial forms of heat-stroke, as has been done by Fayrer and others. The truth is, that the symptoms or tendencies so indicated are *all* manifested to a greater or less extent in severe cases of heat-stroke. It may and does happen, especially in weakly individuals or those with fatty hearts, that *cardiac exhaustion* of so extreme a character as to immediately threaten life is produced by exposure to great heat without the temperature of the body being raised to any appreciable extent. On this account cases might, perhaps, with some propriety be broadly classified as *pyrexial* and *non-pyrexial*; but in the vast majority of cases, whether arising from direct exposure to the sun or otherwise, the temperature of the body is increased, often to an extreme degree. *It may indeed be affirmed as a rule to which there are comparatively few exceptions, that so long as the temperature of the body is maintained at or near the normal, the dangerous effects of external heat are not manifested.*

It will be convenient to describe separately cases of heat-stroke arising from direct exposure to the sun and those occurring in a heated atmosphere away from the sun's direct rays, though, as already intimated, the difference appears to be one of degree rather than of kind.

#### *Solar Heat-stroke.*

Direct exposure for any length of time to the rays of a powerful sun may, in weakly subjects, in those temporarily debilitated by illness or excesses, or in individuals of feeble cardiac power, give rise to such sudden and extreme exhaustion as to destroy life without raising the temperature of the body. The patient falls down pulseless; the skin is pale, clammy, somewhat cyanotic; froth issues from the lips; there is a prolonged gasp or two, perhaps a slight convulsion, and death ensues very rapidly, unless prompt relief is at hand. The impulse of comrades to at once lift a man who has so fallen into a sitting posture, and so maintain him until the arrival of the doctor, tends, of course, materially to hasten the end. I have seen one such case apparently rescued from death by the prompt administration of a hypodermic injection of ether, followed, as soon as the man could swallow, by a couple of ounces of brandy. Most commonly, however, the symptoms produced by direct exposure are of a different kind. They occur, perhaps, with greater frequency in full-blooded muscular men than in weaker ones. There are no premonitions beyond pain or fulness in the head, intense thirst, giddiness, and dimness of sight, with a feeling of nausea and sinking about the cardiac region.

I have questioned a large number of patients with reference to the alleged frequency with which objects appear of a yellow or uniform grey colour prior to the attack, but none could remember having experienced any such sensation. Increased frequency of micturition, which has also been described as a premonition, is, in my experience, of most frequent occurrence in cases arising away from the sun, especially during the night. Without then any very definite premonitions, a man exposed to the direct rays of the sun, most

frequently while undergoing active muscular exertion, but often, also, while standing still in the ranks, falls down insensible. He is often at once strongly convulsed, the skin is pungently hot and dry, the face livid, and after a few moments deeply cyanosed. The respiration is stertorous, irregular, often gasping, always greatly embarrassed. The pulse at the outset is occasionally full and laboured, but speedily becomes thready, irregular, scarcely perceptible. The bowels and bladder in severe cases are evacuated involuntarily. *The temperature of the body is always greatly raised.*

Unless the patient is speedily removed into the shade and energetic measures employed for reducing the body temperature, the attack may prove rapidly fatal. Both the respiratory and the cardiac centres, and the ganglia of the heart, appear to be overpowered by the great accession of heat, and death in most cases seems to be attributable in about an equal degree to interference with the functions of respiration and circulation.

Violent tetanic convulsions are sometimes prominent features in the case.

There is a very high rate of mortality among the cases of heat-stroke that occur from direct exposure. This is doubtless to some extent due to the fact that such cases often occur among soldiers under circumstances, as during military manœuvres or operations before the enemy, in which efficient measures for reducing temperature and protecting from the sun, cannot be employed without some delay. Under more favourable circumstances the prospect is more hopeful. Such cases, in my experience, recover more rapidly and with less ultimate injury to the nervous system than those in which the symptoms are developed more slowly, as in the heated atmosphere of rooms at night.

Cases of solar heat-stroke vary, of course, in severity, the foregoing description being mainly applicable to the severer cases.

#### *Asolar Heat-stroke.*

High temperature in the shade, however produced, may, as is well known, give rise to the symptoms of heat-stroke. Especially is this the case in a still, moist atmosphere. A far higher degree of heat can be borne when the air is dry and in motion than when the opposite conditions prevail. The heated and vitiated air of tents, huts, or barrack-rooms during still nights in the tropics is especially dangerous. An individual lies down to sleep in such an atmosphere and may die very quickly of a combination of asphyxia and heart failure. The highly rarefied atmosphere in which the absolute amount of oxygen is greatly diminished is insufficient for the support of respiration, the lungs become engorged, the heart embarrassed and asphyxia ensues.

In ordinary cases of heat-stroke occurring in the shade, there is commonly some warning of the approach of dangerous symptoms. The patient feels out of sorts, restless and irritable. There is increased frequency of micturition, intense thirst, nausea, and febrile disturbance. The last-named condition, as already remarked, is that which perhaps above all others, most predisposes to an attack. The cooling mechanism of the body being deranged, the temperature rises rapidly in a hot atmosphere, often reaching an extreme elevation. I have found it as high as 114° F. when the symptoms of heat-stroke were developed. The patient seldom falls suddenly insensible; the symptoms come on gradually. Attention is usually attracted to the patient by loud stertorous breathing. Insensibility is generally at first incomplete, the patient can be roused to some extent. The eyes are half open and staring; pupils commonly dilated, sometimes contracted or irregular, always insensible to light. The respiration is greatly embarrassed and laboured, the surface cyanosed. The pulse is increased in frequency, generally feeble and fluttering. The coma deepens rapidly. Convulsions of a tetanic character, with trismus and opisthotonos, are of frequent occurrence. The temperature of the body is raised, usually above 105° F., not infrequently as high as 110°, or even more.\* Unless speedy measures are adopted for reducing the temperature, the coma soon becomes profound, and if long neglected, the case is usually hopeless. Cases, of course, differ somewhat widely as regards severity and the special

\* This statement is based on abundant experience of cases at Suakin. The range of temperature there in cases of heat-stroke was higher than what I have observed in India.

character of the symptoms. In some the respiration is principally affected, in some the cardiac failure is most evident, while in others, even where insensibility is not complete, convulsions are most prominent. Still, as I have before remarked, it is hardly justifiable on this account to divide the affection into distinct varieties, as both the asphyxial, syncopal, and convulsive tendencies are present to a greater or less extent in *all* cases, and have to be met by appropriate methods of treatment.

In describing cases of heat-stroke, as, indeed, in all general descriptions of disease conditions, one can at best only present a composite picture. A more or less typical case selected from a large number which occurred at Suakin in the hot weather of 1885 will serve, perhaps, better than a set description to illustrate the phenomena observed in cases of solar heat-stroke.

Sergeant M., aged 29, a well-made, muscular man, said to be temperate, who had been ailing some days with loss of appetite and feverishness, was found in his tent at 7 p.m. insensible, and brought to hospital. The thermometer that day in the shade had registered 118° F., and the evening was very still and oppressive. On admission the patient was profoundly comatose, breathing stertorously. The temperature in the axilla was 108·8° F., the respiration was much embarrassed, the surface cyanosed, the pulse irregular and hardly perceptible. The jaws were rigid, and tetanic convulsions with severe opisthotonos occurred frequently. After several hours continuous treatment with iced-water douches, iced-water enemata, &c., the patient was roused to partial consciousness. The restoration to consciousness was signalled by a continuous whining cry as of one trying to shake off a nightmare. He vomited several times, and passed involuntary motions. The trismus and opisthotonos gradually disappeared, but the hands and forearms remained flexed and rigidly fixed for several hours.\* His condition progressively improved during the night, anti-pyretic treatment being employed without intermission, and on the following morning he was free from convulsions, the pulse was fairly full and regular, temperature in the axilla 101° F. He was drowsy, and when roused by questions, delirious and incoherent. These symptoms gradually passed away (patient being kept day and night in a wet sheet), and on the morning of the second day from the attack his temperature was normal, pulse regular, respiration natural. He was quite conscious, but suffered from some confusion of ideas, though he answered questions in a perfectly rational way. Just then an opportunity offered of sending him away from Suakin, and he was invalided.

The severity of the convulsions (which are always, in my experience, of a *tetanic*, and not, as described in books, of an *epileptoid* character) is in direct proportion to the elevation of the body temperature. In some cases, however, where the coma is very profound there is no convulsive action. Embarrassment of respiration tending to asphyxia is almost invariably a prominent symptom. In all cases with very light temperature, and such are the rule, the heart's action is greatly disturbed. The pulse is small, weak, excited, and irregular; in some cases hardly perceptible. The early restoration of the pulse is always a hopeful sign, and one of the best indications, I think, of the good effect of treatment. The condition of the pulse, in my opinion, is, in most cases, the safest guide to prognosis. *Vomiting* is often a prominent symptom, especially while the temperature is being reduced. It has been described as an unfavourable, almost fatal, sign (Flint). I certainly cannot so regard it. On the contrary, I am disposed to look upon it as of good omen, indicating, as it does that the activity of the reflex centres is being restored. I have noted its occurrence in a large number of cases ending in recovery, and it has been entirely absent in nearly all the fatal cases attended with profound coma.

*Relapses* are extremely likely to occur after all severe attacks of heat-stroke when patients during convalescence, are continually exposed to high temperature, and are generally fatal. A patient has apparently recovered from a bad attack; all the symptoms have nearly disappeared; he is quite conscious, and may pass through the comparative cool of the night in a most hopeful condition. During the heat of the following day his temperature again rapidly rises, insensibility gradually comes on, and ultimately profound

\* A very common symptom in severe cases.

coma from which nothing can rouse him. The respiration is loudly stertorous, irregular, and gasping; the pulse feeble and flickering, sometimes intermittent; the pupils are dilated and insensible to light. After, perhaps, several hours of painful struggle the end comes. The condition here I believe to be one of *congestive apoplexy*, resulting in serous effusion, though I have unfortunately never been able to make a *post-mortem* examination in cases of this nature, which were numerous enough at Suakin. It is the only condition observed in my experience which would justify the use of the term *apoplexy* in connexion with cases of heat-stroke. The great liability to relapse emphasises the necessity of watching all cases of heat-stroke during convalescence with the most jealous care. The subject will be further alluded to in the section on treatment.

#### *Pathology.*

The statements made in Section I. as to the physiological effects of heat on the various organs and functions of the body will suggest explanations of the mode of production of heat-stroke. Such explanations in our present state of knowledge must necessarily be more or less speculative and cannot be entered into here. The elevation of the body temperature seems to me, at least in the great majority of cases, to be at the root of all the symptoms. The rise of temperature is no doubt attributable primarily to paralysis of the heat-regulating mechanism. Then the functions of respiration and circulation (which are affected in nearly all cases, and to whose failure a fatal termination is due) are in turn paralysed by the great accession of body heat. No doubt the *blood* is also profoundly affected. The corpuscular or oxygen-carrying element may be more or less destroyed, but there is a want of satisfactory clinical evidence on this point with regard to man.

Allusion may be made to the idea promulgated by Vallin, of Paris, as an outcome of experiments on animals, that death in cases of heat-stroke is due to coagulation of the muscular liquid (*myosin*) of the heart and diaphragm. This coagulation is said to take place at 112°-113° F. Well-authenticated instances of recovery where the body temperature was over 114° F. (I have seen one) would tend to negative this supposition.

#### *Post-mortem Appearances.*

Only a few sentences can be devoted to an account of the *post-mortem* appearances in fatal cases of heat-stroke. Some information on this subject will be found in books. I have only had an opportunity of making two autopsies in these cases. In both of these the naked eye appearances were not of particular interest, and were only what might have been predicted from the symptoms during life. The lungs were greatly engorged: In one case the right side of the heart was distended, in the other nearly empty. The brain and its membranes were congested, as were also, to a less extent, the medulla and spinal cord. The abdominal organs were but little affected, with the exception of the liver, which in each case presented intense interlobular congestion. The substance was more friable than natural. I have not been able to find any good description of the microscopic appearances of the nervous centres.

#### *Sequelæ.*

The sequelæ likely to supervene on severe attacks of heat-stroke, such as paralysis, insanity, epilepsy, mental impairment, neuralgia, and various nervous symptoms, can only be enumerated. I have no personal knowledge of these after effects, but the possibility of their occurrence, which has been attested by many authorities, should be borne in mind. The hyper-susceptibility to heat which so often remains as a permanent condition after bad attacks has been already described.

### SECTION IV.

#### *Prevention.*

The precautions which should be adopted with a view to averting the severer effects of exposure to heat are pretty fully described in text books, and will only be briefly referred to here. Adequate protection from the intense heat of

the tropical sun in well-constructed buildings supplied with proper contrivances for cooling and changing the air, sufficiency of cubic space, free ventilation, and good sanitary surroundings are of cardinal importance. The dress should be loose, and of proper material and colour. Thin white flannel of loose texture is perhaps the best that can be worn. On account of the expense, it is hopeless to expect that such material can ever be generally supplied to soldiers. The present well-nigh impermeable material—*kakee* or white drill—supplied to troops is bad. A light loose textured serge, allowing of free evaporation from the skin, would be better. The head and spine should be well protected. Various kinds of helmets and spine pads have been used which fulfil this object pretty well. During exposure to great heat, especially in the open, it is an excellent plan to freely saturate the dress, head covering and spine protector with water. Carrying a wet sponge in the helmet is a good plan. Imprudent exposure of the surface of the body to the heated atmosphere, as is apt to be practised by soldiers who remove their shirts in barrack-rooms, tents, &c. to relieve the irritation of prickly heat, should be carefully avoided. On the march the ranks should be as open and the men relieved of as much weight as possible. A mischievous fallacy prevailing among some combatant officers, that men when exposed to great heat should drink as little as possible, should be corrected. Men when marching in great heat should be allowed to drink freely, and when the supply of water is abundant, ought to be encouraged to saturate their clothing with it. There is no doubt that alcoholic stimulants should be avoided during exposure to a hot sun. This rule should not, however, be too rigorously enforced in every case. A small quantity of brandy or whiskey in a bottle of cool aerated water is often the means of averting dangerous exhaustion *when given opportunely*. It should never be given *before a march* or until a distinct indication for its administration arises. The physiological considerations referred to in Section I. indicate the great importance of avoiding severe or long-sustained muscular exertion in a hot atmosphere. Where the power of resistance is impaired by the presence of febrile disturbance, the greatest possible care should be taken to keep the body temperature within bounds by means of anti-pyretic measures. During very hot, still nights in the tropics it is best, if possible, to sleep in the open, on the roofs of buildings or raised platforms where the air can circulate freely. This is often of the greatest benefit to the sick, especially fever cases. There is an unfounded prejudice in the minds of many against "sleeping out." "Dews" and "malaria" are the bugbears that haunt the imaginations of these people, though malaria can certainly penetrate into an open building with as much facility as it can mount to its roof or to a well-raised platform, and dews under the circumstances I am contemplating are of little consequence.

#### *Treatment of Heat-stroke, &c.*

The first and chief indication in the vast majority of the cases of heat-stroke with which we have to deal is to reduce the temperature of the body, the increase of which is, as I have already observed, at the root of all the symptoms. The higher the temperature of course the more imperative the necessity for its speedy reduction. To effect this, when an abundant supply of ice and water is available, we have happily very efficient means. The patient should be stripped naked, and placed on a bed covered with a waterproof sheet, having the head slightly elevated. Water from a pail containing large lumps of ice should be poured rapidly from a height of 2 or 3 feet all over the body, the overflow conducted through a channel in the waterproof sheet, being received in a pail also containing ice, at the opposite side of the bed. This pail should be used when the other is empty, and the operation continued without intermission until a distinct effect is produced. At the same time, ice should be applied to the head and spine either direct or by means of india-rubber ice caps, and Chapman's spinal ice bags. The latter, however, are apt to get out of order in hot climates, and so cannot be relied on, but when available they economise ice and are otherwise convenient. The application of ice to the spine seems by far the most effectual method of controlling the tetanic convulsions so often present in severe cases. An ice-water enema should, as soon as possible, be administered. This measure, first

suggested by Dr. Parkes, is of great utility, not only in helping to lower the temperature, but in restoring by absorption the normal fluidity of the blood, and when, as so often happens, the sphincter is relaxed, in reviving the tonicity of the bowel, thus enabling it to retain nutrient or medicated enemata.

The measures just described continued steadily for some time have a most marked effect in stimulating the exhausted nervous centres, more especially the respiratory, restoring the circulation and rousing the patient to consciousness. The treatment may have to be continued for several hours before the symptoms are brought under control. It should be suspended when the temperature has sunk to normal. It is not, however, always easy to ascertain when this has taken place during the continuance of treatment, as the thermometer in the axilla or rectum deluged with ice water can, of course, give no true indication, and it is generally impossible owing to the restlessness of the patient or the spasmodic closure of the jaws, to take the temperature in the mouth. Under these circumstances reliance can only be placed on the general effect produced. When the patient has been partially restored to consciousness and the convulsions have subsided, it is well to relax the more active treatment, covering the patient with a wet sheet, and leaving everything in readiness for a renewal of the active treatment should the temperature of the body again rise or the convulsions return. I will here repeat that the great liability to relapse should be constantly borne in mind, and due precautions adopted for its prevention. As the relapse generally occurs during the heat of the day, cases should be watched at this time with the utmost care, and any rise of temperature at once controlled by the means above indicated. At Suakin the best results followed the application as a matter of routine, throughout the day of the wet sheet to all patients who had recently suffered from heat-stroke and to those labouring under pyrexial conditions from whatever cause arising. In the latter cases it was the means, I am convinced, of averting many an attack of heat-stroke. In no case has evil seemed to result, even from very prolonged application of cold to the surface. The enormous generation of heat in these cases seems to give the body an almost indefinite power of resistance to cold. I have known a patient, who ultimately made a good recovery, kept in a cold wet pack for 48 hours. The temperature in the rectum during that time never fell below  $99^{\circ}6'$ , the temperature of the atmosphere during the same period being uniformly high.

While the method of reducing temperature just described is of the first importance, there are certain subsidiary remedies which may be employed at the same time according to indications. Of the efficacy of some of these in promoting recovery I am from experience fully convinced, while with the effects of others, though they appear to me to be worthy of mention, I am not practically acquainted.

*Digitalis* has, in my experience, proved of signal service in restoring the power of the exhausted heart. It was often given during the continuance of antipyretic treatment, and its effect on the feeble and failing pulse was usually most marked. In cases characterised by almost complete pulselessness a speedy restoration of the arterial beat at the wrist frequently followed its administration. It was usually given by enema in doses of 20 to 30 minims of the tincture, sometimes with a couple of ounces of brandy in iced water, and repeated according to circumstances. Hypodermic injections of from 10 to 20 minims had also an excellent effect on the pulse. Brandy alone, or hypodermic injections of ether, never had, even transiently, so good an effect.

*Hydrate of chloral*, given by enema in doses of 40 to 60 grains, is of distinct use in subduing the tetanic convulsions so frequently present. I have often given it with digitalis and brandy when the convulsions were at their height, and always with an apparently good effect. It may be given to produce sleep during convalescence.

*Bromide of potassium*, with or without chloral, is frequently of great benefit in relieving the sleeplessness, restlessness, headache, and nervous irritability supervening on the acute attack.

*Atropine*.—I have tried the hypodermic injection of atropine ( $\frac{1}{100}$  gr.) in some cases, in view of its alleged stimulating effect on the respiratory centre, with hardly any notable result.

*Alcohol*, chiefly in the form of brandy, in doses of one or two ounces, by the mouth or rectum (chiefly by the latter channel), repeated as often as the individual case seemed to demand, was given in numerous cases at Suakin with apparently good effect. As a temperature reducer its action in the cases under consideration is unreliable, and it would, in my opinion, be injudicious to employ it with that object; but there is no doubt, of course, as to its power of at least temporarily stimulating the action of the heart, an effect which is frequently desirable. When the acute attack has been combated, and during convalescence, alcohol, as a rule, is not called for, and in the majority of cases had better be withheld.

*Quinine*, administered by the mouth or rectum, is not, in my experience, a remedy on which much reliance can be placed in heat-stroke, while its action in the large doses required to produce a distinct anti-pyrexial effect may be prejudicial to the already exhausted nervous system. The hypodermic injection of the neutral sulphate may possibly hold out more promise; I have no experience of this method of administration. With the means of reducing temperature already described at our disposal, there is no need, however, to waste time or endanger the life of the patient by resorting to medicinal anti-pyretic remedies. Given in moderate doses in the ordinary febrile affections which so strongly predispose to heat-stroke, quinine may prove efficacious in warding off an attack.

*Nutrient enemata* are of the greatest importance in the management of severe cases. Many such have been preceded for some days by failure of appetite and abstinence from food, so that when patients come under treatment their nutritive condition is already low. The exhaustion of the nervous and muscular tissues resulting from the attack, with its accompanying violent convulsions, tends further to reduce the patient. It is, therefore, most important to supply proper nutriment to the system as soon as possible. Should the patient be able to swallow, this had better be done by the ordinary channel; but when, as most frequently happens, that is not practicable, owing to spasm of the jaws or the unconscious state of the patient, nutritive enemata should be given. These may consist of beef tea with brandy, meat juice, milk, or some *peptonised* preparation of food. The latter, at least on theoretical grounds, would seem the most eligible, but I have no experience of it. On the whole, beef tea seems to be the most useful of readily procurable articles.

*Artificial respiration* by Sylvester's method has been resorted to in some cases where the temporarily paralysed respiratory centre could not be roused to action in the ordinary way, the heart continuing to beat though feebly, and has apparently tided patients over what might have been a fatal stoppage of the respiration. It is a proceeding that should never be neglected under the circumstances indicated.

*Chloroform* may be useful in controlling convulsions, but I have never found occasion to use it, and looking to the condition of the circulation and respiration in most cases, I imagine its use cannot be unattended with danger.

*Oxygen inhalation* appears to me to afford promise of great efficacy in many cases, though I have never had an opportunity of trying it.

*Blood letting*, though I have never found occasion to employ it, well deserves mention, I think, in connexion with the treatment of heat-stroke. Dr. Alfred Wiltshire (Quain's "Dictionary of Medicine," p. 115) says with regard to it: "There are few disorders in which blood letting is more successful when 'rightly employed than in sunstroke. It is seldom necessary to take more than a few ounces of blood. The insensible patient, with turgid veins, tight pulse, and labouring heart, will gain immense and prompt relief from 'venesection.'" Though the abstraction of blood as a routine measure is much to be deprecated, and has no doubt been a fertile source of mischief in the past, there really seems to me no good reason why the practice should be altogether abandoned in cases of heat-stroke. In certain cases, especially where the patient is strong and full-blooded, pulmonary congestion and distension of the right heart may be relieved by a moderate bleeding, and I fail to see what harm can accrue from it under such circumstances. It might be especially valuable in the absence of efficient means of reducing temperature.

One cannot of course speak with much confidence in the absence of practical experience, but I do not hesitate to express the opinion, that, notwith-

standing all that has been said in condemnation of venesection (or, more properly perhaps the *abuse* of venesection) in heat-stroke, and though the practice is now universally out of fashion, no preconceived prejudice should be allowed to stand in the way of its employment in suitable cases.

Various other remedies have been suggested in heat-stroke. It would, I think, serve no useful purpose to enumerate them. Of some it may be said that they are doubtless free from danger, though they may not recommend themselves to one's common sense; others, such as the *hot bath*, nitrite of amyl, nitro-glycerine, &c., can hardly be dismissed with such mild condemnation. They would, in my judgment, most probably prove distinctly hurtful.

It is satisfactory to be able to state that the plan of treatment sketched in the opening paragraphs of this section is attended with what may be regarded as highly successful results. Of 65 cases treated at Suakin between the 22nd of May and the 31st of October 1885, mainly on the principles I have endeavoured to enunciate, 15 died; a mortality of 23·07 per cent. This mortality compares very favourably with that usually given in text books, 45 to 50 per cent. (Fayrer, in Quain's Dictionary). The cases in question were all severe (the slighter cases being returned under the head of "Heat Exhaustion"), and were treated under as disadvantageous circumstances as could well be conceived, the protection for the sick afforded by the hospital huts (though excellent of their kind), being quite inadequate during the heat of the day, and the surroundings generally being most unfavourable.

The treatment of the slighter forms of *heat exhaustion* should be conducted on general principles. The tendency so often present to over-indulgence in stimulants should be rigidly repressed. The food should be nourishing, easily digested, and taken in small quantities at frequent intervals, overloading the stomach and long periods between meals being alike objectionable. This rule, is of course, impossible of enforcement among soldiers who continue at duty. Small doses of nerve tonics, such as arsenic, quinine, and valerianate of zinc, may be given with benefit. In cases marked by irritability of temper and tendency to emotional excitement, bromide of potassium with arsenic is very useful. Chalybeates are commonly indicated by the anæmia present, but should be given with caution, as they are apt to aggravate hepatic and digestive disturbances. Easton's syrup of the triple phosphates, in doses of from 20 to 40 minims in a bottle of cool aerated water, I have found very useful in some cases, both for its hæmatinic and tonic properties, and in relieving the craving for stimulants. Moderate exercise, means of mental and bodily recreation, rousing the patient to a sense of honour and duty, and stimulating him to take the most cheerful view of his surroundings, are valuable aids towards restoring and maintaining the nervous energy under trying tropical conditions. The importance of *morale* under such circumstances can really not be over-estimated. Much will depend on the example of superior officers.

All patients convalescent from severe heat-stroke and cases of serious exhaustion should be removed to a cold or temperate climate as soon as possible, and not be allowed to return to the tropics until the general health is completely restored.

In conclusion it must be remarked that all cases of heat-stroke demand the most assiduous personal attention on the part of the medical officer. Experience shows that it is well-nigh hopeless to entrust the carrying out of the plan of treatment sketched in these remarks to attendants however apparently trustworthy. They can, as a rule, only imperfectly appreciate the necessity of the unremitting attention which most cases require, and they are apt to relax in their efforts at most critical moments for the patient. It follows of course that the charge of a number of heat-stroke cases must impose great physical and mental strain on the medical officer; but the successful results that may be attained in even apparently desperate cases, will well repay the trouble entailed in their management.



## APPENDIX No. XVII.

NOTES ON THE SURGICAL PRACTICE AT THE ROYAL ARSENAL,  
WOOLWICH, DURING THE YEARS 1884 AND 1885.

By Surgeon-Major G. T. LANGRIDGE, L.R.C.P. Lond., M.R.C.S. Eng.,  
Medical Staff.

As I have to furnish a report in connexion with the examination for promotion to the rank of Brigade-Surgeon, I have thought that it would be far more interesting if I related points of surgical practice which have come within my experience in connexion with the Royal Arsenal, instead of writing a medico-topographical report. Surgeon-Major W. D. Wilson, M.B., who is in medical charge of the Arsenal, has been kind enough to allow me to place on record any observations drawn from cases under his more immediate care during the period embraced in this paper, which is not intended to be an official report of the institution, which would, of course, be submitted by the medical officer in charge, Surgeon-Major Wilson.

The number of men employed during these years at the Royal Arsenal varied from about 9,000 to about 12,000, and for the greater part of this period work was carried on night and day. Owing to the nature of their employment, at various kinds of machinery in motion, amongst explosives, or in lifting heavy weights, loading and unloading shipping, &c., it is easy to conceive that the number of accidents was very considerable. Nightwork, which was almost constant, owing to press of work caused by the various wars, expeditions, &c., would naturally be supposed to be a considerable factor in raising the total; but, in these years, such was not the case, comparatively few accidents happening at night.

The injuries enumerated in this paper occurred when the men were actually at work in the Arsenal or Dockyard. There is no hospital at the latter place, and all serious injuries occurring there are sent to the Arsenal Hospital.

If the accident be so severe as to prevent the sufferer continuing at his work, he is placed on the "Injury List," and whilst on it receives full pay.

If the accident happens to him when not at work, he is placed on the "Sick List," and receives pay in proportion to length of service for a certain period in each year.

Previous to a man being placed on the "Injury List," the accident must be certified to by his foreman and the Principal Medical Officer of the Arsenal. The former certifies that it occurred at work, and how it happened; the latter that it really is an injury, its nature, and whether slight or severe. Only those men who are on the "Injury List" are entitled to admission into the Arsenal Hospital, which is very small, containing only 20 beds. Occasionally, however, urgent cases of sickness occurring in the Arsenal are taken in temporarily until they are in a fit state to be sent home. As will be seen further on, in the table of injuries, a few cases of sickness induced by the nature of the patient's work, such as lead poisoning, were given the benefit of the "Injury List."

## RETURN OF INJURIES RECEIVED AT WORK FOR THE YEARS 1884 AND 1885.

	1884.	1885.	Remarks.
Number of cases of injury treated	2,665	4,317	
Number placed on the Injury List	856	1,260	
Total number of attendances of patients	12,403	20,305	
Number admitted into hospital	202	198	
Average number daily in hospital	6.91	10.03	
Fatal cases	1	4	

From the above it will be seen that in 1884, out of 2,665 injuries, only 856 were sufficiently serious to prevent the sufferer continuing at his work, and in 1885 only 1,260 out of 4,317.

The great increase in the number of injuries in 1885 over the preceding year was due simply to a greater number of men being employed. The total number of attendances of patients would have been much larger, but during these years aseptic surgery, as taught by Sir Joseph Lister, was strictly carried out, with the result of obviating the necessity of a daily attendance, and often of permitting patients to remain away for several days at a time. The relative number admitted into hospital is small. The men, as a rule, are married, or have fairly comfortable homes of their own, where they can be well looked after; so that unless the injury is a very serious one, or one implicating a lower extremity, and thus preventing him from walking to and fro from his house to the surgery, he is allowed to attend as an out-patient.

#### FATAL CASES.

Only one fatal case occurred in 1884, due to injuries received at work. In this case death was due to multiple injury caused by a shell bursting. Another patient, who was admitted into hospital suffering from contusion of the leg, died there suddenly of heart disease.

In 1885 there were four deaths. All were due to multiple injury, caused in each case by a fall from a height.

In all four, from the symptoms, there was no doubt that fracture of the base of the skull existed, although, as no autopsy was made, the diagnosis was not confirmed.

#### FATAL CASES IN 1884.

G. L. was employed breaking up old shells with a sledge hammer. Amongst them was a live one, which he had overlooked, and this, when struck, exploded, causing the following injuries:—

Multiple injury from a shell bursting.

Compound comminuted fracture of the right femur into the knee-joint, which was widely opened.

Severe lacerated wound of the left thigh. Compound comminuted fracture of the left tibia.

An extensive lacerated wound of the left lumbar region, penetrating the abdominal cavity and both large and small intestines.

Deep lacerated wound of the right buttock, penetrating the pelvic cavity.

In spite of all these injuries, he lingered for nearly three quarters of an hour. He was in great agony, but conscious and able to reply to questions.

The following death occurred in hospital from disease of the heart in a man suffering from an injury:—

R. B., age 55, struck his leg whilst at work on the site of an old cicatrix. The wound inflamed. He was admitted into hospital and confined to bed. The wound had almost healed, when he was suddenly seized with acute pain in the cardiac region, and symptoms of collapse supervened. This condition was relieved by sinapisms and stimulants, but two days afterwards the same symptoms recurred, accompanied by urgent dyspnoea. He rapidly became pulseless, and died in half an hour.

At the autopsy the wound was nearly healed.

The heart was in a state of fatty degeneration; there was a clot, partly organised and partly recent, which filled the pulmonary artery, and extended through its branches to the minute ramifications of this vessel in the lungs.

All the organs, except the heart, were fairly healthy.

#### FATAL CASES IN 1885.

R. R. fell down the gangway into the hold of a barge, alighting on his head. When admitted, he was completely insensible, and blood was flowing from his nose and both ears.

Multiple injuries.

The right pupil was dilated. There was a contused wound of the scalp over the right parietal bone, but no apparent fracture in that situation. The right shoulder was seriously contused, and there was acromio-clavicular dislocation.

For four days he remained completely insensible, and was fed with enemata, after which he became sufficiently conscious to take his nourishment, and to ask for his pipe. This request he repeated constantly, but made no other remark, and could not understand questions addressed to him. He remained in this condition for four days, after which he gradually became comatose, and died 12 days after the receipt of the injury.

R. B. fell from a height whilst whitewashing. When admitted he was perfectly unconscious.

There was bleeding from both ears, both pupils were dilated, and the breathing was stertorous. There was a contused wound of the scalp, without a fracture in that situation, and the right clavicle was broken. He remained unconscious, and died three days afterwards.

D. A. also fell from a scaffold whilst whitewashing, and alighted on his head. When admitted he was insensible, and was bleeding from both ears. The left side of the scalp was severely contused, but there was no wound nor any apparent fracture in that situation. The left clavicle and two ribs on the left side were broken. He did not regain consciousness, and died two days after the receipt of the injury.

G. P. fell from a height when painting. There was a contused wound of the scalp, and a comminuted fracture of the acromial end of the right clavicle. He was perfectly insensible, and bleeding from the nose and both ears. The pupils were dilated and complete paralysis of the right side was present. He remained unconscious, and died in about an hour.

TABLE of ACCIDENTS, &c. sufficiently serious to be placed on the "Injury List."

	1884.	1885.	Remarks.
Multiple injuries - - - - -	1	4	
Amputations - - - - -	4	5	
Complete crush of part - - - - -	15	21	
Fractures - - - - -	24	48	
Separation between costal cartilage and rib - - - - -	1	—	
Dislocations - - - - -	—	3	
Contusions and wounds - - - - -	583	860	
Sprains - - - - -	73	99	
Burns and scalds - - - - -	81	108	
Concussion of brain - - - - -	—	1	
Hernia - - - - -	4	—	
Injury to eyes - - - - -	68	103	
Total - - - - -	854	1,252	
Lead poisoning - - - - -	—	8	
Carbolic acid poisoning - - - - -	1	—	
Chill from immersion in a well - - - - -	1	—	
Grand total - - - - -	856	1,260	

Multiple injuries.  
Amputations.

These are all alluded to under "Fatal Cases."

These occurred solely to fingers, the part being completely separated from the body, either by circular saws, or by planing machines, or by a heavy weight falling on it.

Amputation higher up was required in almost all cases, which were none of them of special interest.

These occurred exclusively to fingers and toes.

In 1884 there were 12 cases of crushed fingers and 3 of toes, whilst in 1885 there were 17 of the former and 3 of the latter. They all required amputation, and were none of them noteworthy.

Complete crush  
of a part.

TABLE OF FRACTURES.

	1884.				1885.				Total.	Remarks.
	Simple.	Comminuted.	Compound.	Compound and Comminuted.	Simple.	Comminuted.	Compound.	Compound and Comminuted.		
Skull - - -	-	-	-	-	-	-	-	1	1	
THORAX.										
Clavicle - - -	1	-	-	-	7	-	-	-	8	
Scapula - - -	1	-	-	-	-	-	-	-	1	
Rib - - -	1	-	-	-	2	-	-	-	3	
Separation between costal cartilage and rib.	1	-	-	-	-	-	-	-	1	
UPPER EXTREMITIES.										
Radius and ulna -	-	-	-	1	2	-	-	-	3	
Radius - - -	1	-	-	-	1	-	-	-	2	
Metacarpal - -	-	-	-	-	2	-	-	-	2	
Phalanges single -	1	-	4	1	4	-	11	4	25	
" of two -	-	-	1	1	-	-	-	-	2	
" of three -	-	-	1	-	-	-	-	-	1	
LOWER EXTREMITIES.										
Femur - - -	-	1	-	-	-	-	-	-	1	
Tibia and fibula -	-	-	-	-	4	1	1	-	6	
Tibia - - -	-	1	-	-	-	-	-	-	1	
Os calcis - - -	1	-	-	-	-	-	-	-	1	
Metatarsal - -	2	-	-	-	1	-	-	-	3	
Phalanges - - -	1	-	3	-	5	-	2	-	11	

J. F., a labourer, was unloading iron pipes from a barge; one of these fell against his face, producing a compound comminuted fracture of the supra-orbital ridge of the frontal bone.

Fracture of the skull.

The wound suppurated, and a portion of the ridge, about three quarters of an inch in length, necrosed. The sequestrum was removed and the wound healed rapidly. For three months he suffered from deep-seated pain in the head, insomnia, and loss of flesh, for which he was treated principally with bromide of potassium and quinine, and occasional doses of hydrate of chloral. At the end of this period he resumed his work, feeling quite well.

In this case the patient fell through a hatchway into the hold of a ship which he was assisting to unload, and alighted on his back. There was very considerable bruising, and the body of the scapula was fractured transversely, immediately below the spine.

Fracture of the scapula.

Crepitation and mobility could be plainly distinguished, but there was no displacement.

A poroplastic splint was moulded to the part, a body bandage applied, including the arm, and the forearm placed in a sling.

He made an excellent recovery, the bone uniting without deformity, and no loss of power resulting.

This somewhat rare injury occurred to a man who was lifting a heavy box on to his shoulder.

Separation  
between the  
second costal  
cartilage and rib.

He felt a sudden acute pain in the chest, and heard something snap, which he thought at the time was a brace. After this there was constant pricking pain, increased on inspiration and coughing. There was tenderness, together with unnatural mobility and irregularity of outline at the junction of the cartilage and rib, the latter being depressed.

The treatment consisted in the application of a piece of strapping, a foot wide, round the whole circumference of the chest. The symptoms were at once relieved, and he made an excellent recovery.

Simple fractures  
of the radius and  
ulna.

There were two cases of simple fractures of these bones. One was caused by falling heavily on the arm and fracturing both bones transversely at the junction of the middle and lower thirds.

In the other case the patient was working at a machine for trimming the edges of strips of brass, which are converted later on into cartridge cases. These strips, technically called a coil of strip, revolve with extreme rapidity. His arm, protected with a long thick glove, was caught by one of these strips, which had snapped in two, and was twisted violently. Both bones were broken at the junction of the middle and lower thirds, and the arm was completely twisted round. Great deformity was present, and enormous swelling shortly afterwards supervened. Some difficulty was experienced in reducing the fractures, and bringing the ends into good apposition. The case did well, however, and the fractures united most favourably. Very little callus was thrown out, and the arm at present is as strong, and its movements are as free, as before the accident. The treatment adopted in both these cases, and which I shall presently describe, is that which I consider the best for almost all fractures of the forearm. Pistol splints and extension apparatus are rarely required, although occasionally useful.

Well padded, rather broad splints are applied anteriorly and posteriorly, from the bend of the elbow to the tips of the fingers, a narrow pad is placed anteriorly, to keep the interosseous space patent, and the forearm is placed in a broad sling.

The forearm should be supinated, and the posterior splint applied first. Then the interosseous pad should be laid on, and last of all the anterior splint should be applied.

In about three weeks the splints should be shortened, so as to allow the fingers to be moved, and, at the end of a month, gentle passive movements of pronation, and supination, should be occasionally performed. In this way adhesions, and subsequent stiffness, and impaired movement are avoided.

Some advocate this being done at an earlier period, but in my opinion it then does harm by causing a greater amount of callus to be thrown out, thus increasing the likelihood of blocking up the interosseous space.<sup>1</sup>

Compound com-  
minuted fracture  
of the ulna, and  
compound frac-  
ture of the  
radius.

This injury was caused in a somewhat similar manner to that described in the last case. A leathern band, revolving at great speed, broke. One end twisted itself round the patient's wrist, and dragged his arm over a revolving roller. If the machine had not been thrown immediately out of gear, his body would likewise have been dragged over it, and would have been mangled.

When seen at the hospital, his arm was twisted completely round, and the soft parts most severely contused. There was compound comminuted fracture of the ulna, and compound fracture of the radius at the junction of the middle and lower thirds. The upper portion of the radius projected through the wound.

Treatment .

The fractures were reduced with considerable difficulty. The wounds were thoroughly syringed out with carbolic lotion 1 in 20, the skin washed with the same, and Lister's carbolic gauze dressing was then applied. The forearm was placed between antero-posterior splints, and in a sling.

The wounds remained aseptic, and healed completely in three weeks.

As it was found impossible to keep the fractures in good position with the ordinary splints, so a special one to extend the arm was constructed. When this was applied he was confined to bed, and the arm was laid on pillows.

This splint was composed of a crutch for the axilla, to which a long narrow splint was attached, extending beyond the tips of the fingers. Near the lower end was a wooden screw, like those on a violin, which extended by means of a collar of spongiopiline round the wrist. To this collar strips of bandage were attached, which were then passed through a slit in the screw. The strips were then screwed up, and in this way considerable extension was obtained, and the fracture kept in good position.

At the end of seven weeks this splint was removed. Short splints were applied, and he became an out-patient, attending daily for passive motion. Union was fairly firm. A considerable amount of callus was thrown out in the interosseous space and at the seat of the radial fracture. The muscles were wasted and somewhat matted together.

The matting and wasting of the muscles have quite disappeared, the arm at present being a most muscular one. There is slight deformity at the site of the radial fracture, and some callus still unabsorbed in the interosseous space, but the greater portion has disappeared. When the arm is prone he is able to close his fingers completely, and his grip is as strong as ever. He is unable, however, to supinate the arm completely, and when supinated as far as it will go, he cannot close the fingers. He has resumed his former work at a lathe.

Present condition.

The following instance of conservative surgery exemplifies the good results which can be obtained from aseptic surgery:

On September 10th, 1885, C. J., a lad of 14, caught his right hand in a machine for rolling out strips of brass for cartridge cases; the following injuries resulting:—

Compound fracture of three fingers with wounds of joints.

Compound fracture of the lower end of the terminal phalanx of the middle finger, communicating with the second phalangeal joint.

Compound fracture of the upper end of the second phalanx of the little finger into the second phalangeal joint.

Almost complete amputation of the ring finger, through the middle of the second phalanx. The finger hung by about a third of an inch of skin on its posterior aspect, all other structures having been divided. The hand was begrimed with oil and dirt, which were ground into the wounds.

I decided to try and save all the fingers, but had little hope of the ring finger. Chloroform having been administered, the injured parts, including the joints, were thoroughly scrubbed with a nail brush, and an equal mixture of boiling soap and water and carbolic acid lotion, 1 in 20, until they were thoroughly purified. Some disorganized shreds of tissue were removed. Bleeding vessels were secured with chromic catgut. The wounds were then washed with carbolic lotion, 1 in 20, and the edges brought together with chromic silk.

They were then dressed with protective and loose carbolic gauze, and the ring finger placed on a finger splint. Over all a Lister's carbolic gauze dressing was applied, and the hand placed on a splint. Evening temperature 99°.

11th. No oozing or pain. He slept well, and his temperature was 99°. After the bowels had acted in the evening it was only 98.8. The dressing was not removed.

12th. Slight oozing. No pain. Temperature 98.8. Removed dressing under carbolic spray. Wounds aseptic and all apparently uniting. Washed the surrounding skin with carbolic lotion, 1 in 40, but did not interfere with the wounds themselves. There was no sensation at the tip of the ring finger.

18th. No pain. Temperature normal since the 14th. Appetite good. Removed dressing under spray. Ring finger uniting. Sensation has returned to the posterior surface and sides, but not to the anterior surface. All wounds aseptic and doing well. Washed skin as before, but not the wounds. Treatment continued.

October 3rd. Middle and little fingers completely healed. Dressings removed and passive motion employed to them. Fracture of the ring finger firm, and wound healing. Dressing reapplied to it.

10th. Wounds quite healed. All dressings removed, and douches and

Present condition.

passive motion ordered. There is still loss of sensation on the anterior surface of the third phalanx of the ring finger, and he is unable to flex the last joints of the ring and little fingers, although the joints themselves are normal, owing to the flexor tendons having been divided. In all other respects the hand is normal, and it is nearly as strong and useful as it was before the accident. He has resumed his former work at the machine. Mr. J. H. Morgan lays down in an article on Surgery of the Hand, in Heath's Dictionary of Practical Surgery, that in cases of lacerated wounds of the hand, accompanied either by fracture of phalanges or wound of joints, amputation must be performed.

But, in addition to the above case, we have had numerous others of the same nature, with equally good results, and therefore I must differ entirely from the line of treatment recommended by Mr. Morgan in these cases.

Comminuted fracture of the femur.

J. F. whilst carrying a box full of Martini-Henry bullets fell, and sustained an extensively comminuted fracture of the femur in the middle third. This was at first put up in a Liston's long splint, with three short splints for the thigh; but as this extension was insufficient, a stirrup and weight were added. 18 days afterwards the splints were removed, and a gum and chalk bandage was applied from the middle of the leg to the groin, extension being kept up as before by the stirrup and weight.

Forty-three days after the receipt of the accident this was removed. Union was perfect. Very little callus was thrown out, and there was no shortening. He was allowed to walk about on crutches, his foot being supported by a bandage extending round the instep and neck. He resumed his ordinary work on the 59th day after the receipt of the injury.

Comminuted fracture of the tibia.

A heavy bale of goods fell from a lift on to this patient's leg, fracturing it at the junction of the middle and lower thirds. The fracture was comminuted, and a longitudinal split extended down the lower third of the tibia into the ankle joint, which was much swollen. Singularly enough, in this instance the fibula escaped injury. The soft parts were greatly contused and swollen from foot to knee. The fracture being reduced, an iron back splint with a foot-piece and two side splints were applied, and the leg laid on a swing cradle.

Twenty-three days after the accident the splints were removed, and as the fracture was fairly firm, a gum and chalk bandage was applied from the foot to the middle of the thigh. The foot was supported by a sling round the neck, he was provided with crutches and allowed to go home.

The fracture united firmly and without deformity, but the ankle remained in a weak and stiff condition for a considerable period.

Simple oblique fracture of the tibia, subsequently becoming compound through cellulitis.

On June 26th, 1885, J. S., a labourer, whilst employed unloading a ship, was struck on the right leg with great violence by a crane, which fractured the tibia and fibula obliquely at the junction of the middle and lower thirds. There was great deformity, extensive contusion of the soft parts, and long abrasions on the inner and outer sides of the middle of the leg.

The fractures having been reduced, the abrasions were dressed with boracic ointment, and the whole leg wrapped in carbolized wool. An iron back splint with a foot-piece and two side splints were applied, and the leg laid on a swing cradle.

June 27th. The leg was enormously swelled from the ankle to the knee, but fairly comfortable, and was re-dressed as before. For the next few days there was but little change in his condition. He complained of hardly any pain, but the swelling showed no signs of subsiding.

July 5th. On this date he became much worse. He had passed a very restless night and complained of great pain in the leg. He was chilly, but there were no rigors. The abrasions had assumed an unhealthy appearance, and an erysipelatous blush extended from the foot nearly to the knee. Wet boracic lint was applied to the abrasions, and he was ordered 20 minims of the tincture of the perchloride of iron four times a day.

6th. Great tension was present, and a few drops of pus exuded from a small opening on the centre of the outer abrasion, which presented a sloughy appearance. The blush now extended half-way up the thigh. Two long deep incisions were made, one on the outer and one on the inner aspect of the limb. A small quantity of thin unhealthy pus escaped from them. The muscles were seen to be lacerated by the ends of the bones, and the soft parts generally

appeared in a sloughy condition. Drainage tubes were introduced, the incisions stuffed with iodoform gauze, and the whole leg enveloped in Gamgee's absorbent gauze and wool tissue, which was prepared with a solution of perchloride of mercury, 1 in 1,000. The iron was increased to 20 drops every four hours. The morning temperature was 99° F. In the evening the wounds were redressed, and about two ounces of pus came away with the dressings. Temperature, 100° F.

7th. He had slept well. Temperature, 99° F. Copious discharge of thin unhealthy pus. Another small incision was required, higher up on the inner side, as tension was present in that situation. The wounds communicated freely with both fractures.

At this time nothing could be worse than the aspect of the case. There was compound fracture of both bones of the leg, with laceration of the muscles, complicated with cellulitis, and for some days the question of amputation was mooted. Against this was the man's wonderfully good general condition. He slept well, without draughts, took his nourishment freely, consisting of milk, beef-tea, and wine, suffered but little pain, and the temperature never rose above 100·3° F. It was therefore decided to await events.

11th. On this date all his symptoms were improving. The blush had disappeared, and the swelling was rapidly subsiding. Morning temperature 99°, evening 99·6° F. Was taking nourishment freely. After this he improved rapidly; the swelling subsided, and sloughs of cellular tissue were cast off. The iron was omitted, but the same dressings were continued.

30th. The wounds looked quite healthy; some union had taken place in both fractures, which were no longer compound, having granulated over. Treatment continued.

August 29th. Fractures firmly united, the upper ends of the tibia slightly overlapping the lower one. Wounds healed, except the outer one, which was quite superficial. He was discharged as an out-patient, and could walk with the aid of a stick.

The third case is a good example of what serious injury may be occasioned by a trivial cause.

W. G. tripped and fell, twisting his leg under him. 'He was, he stated, walking quietly along at the time, and carrying no weight. The fibula was fractured transversely, about 3 inches above the ankle. There was also an oblique fracture of the lower end of the shaft of the tibia, the upper fragment being driven into and firmly impacted in the lower one, which was twisted backwards.

Impacted fracture of the tibia, and transverse fracture of the fibula.

On account of the firm impaction it was found to be impossible, in spite of considerable extension and manipulation, to obtain good position. The case was a very tedious one, and the patient did not resume work for four months. Even then he was slightly lame, and there was some weakness and impairment of motion.

Three of these fractures of the tibia and fibula were due to direct violence, and three to patients falling with the leg bent under them; in two instances whilst carrying heavy weights.

In all six the bones were fractured at the junction of the middle and lower thirds.

In most of them the soft parts were much contused, and in some the ligaments of the ankle were ruptured; this latter injury occasioning trouble, even after the fracture had united firmly.

The three cases which I have not described were all simple and transverse, and presented no features of interest.

The usual method of treatment adopted here for all fractures of the leg which do not require great extension is by an iron back splint with a foot-piece attached to it, two side splints, and a swing cradle.

The leg is laid on the well-padded back splint, extending above the knee. This splint has two cross pieces with slits in them to sling it to the cradle, and is cut away at the lower end for the heel. The footpiece is screwed up almost to a right angle. One or two small pads are placed under the tendo achillis, and the foot and ankle are bandaged to the splints. After extension has been made another bandage is applied above the knee. Some continue the bandage from the foot to the knee; but I object to this, as the seat of the



fracture is hidden, and if swelling supervened the parts might become constricted.

The side splints are then applied and fixed in position by two bands of webbing with buckles, and the leg is swung in the cradle.

The advantages of this method are the following :—

- (a.) It is very easily and quickly applied.
- (b.) The seat of fracture is always visible, so that any displacement can be at once seen, and local applications can, if necessary, be employed.
- (c.) The apparatus is extremely comfortable for the patient, the swing cradle allowing considerable movement in the bed without injury to the fracture.
- (d.) The foot-piece is a great advantage, preventing the foot dropping, and assisting to steady the parts.

This case was under the care of Surgeon-Major W. F. Stevenson, M.B., Medical Staff.

A. R., a feeble man of 53, slipping off a ladder about 12 feet from the ground, alighted on his heels, and fractured the os calcis of both feet. There was no displacement, but slight mobility and distinct crepitus were present.

The fall had jarred the whole system, and there were symptoms of slight concussion of the brain, spine, and both hip joints.

The feet and ankles at once swelled very considerably, and became excessively tender and painful. They were laid in pillow splints.

On the following day plaster of Paris splints were applied, and four days afterwards he was allowed to proceed to his home.

These splints were removed in a month, when most of the swelling was found to have disappeared, and union was firm; but stiffness and weakness of the parts persisted for months afterwards, in spite of treatment, which consisted of friction, passive motion, douches, galvanism, &c. He preferred to take his pension, and the compensation allowed for the injury, to returning to his work in the Arsenal, and was lost sight of before he entirely recovered.

In all four examples of this injury occurring in 1884 the great toe was implicated, and also in both the compound ones in 1885.

The compound fractures were treated aseptically, either with carbolic acid, perchloride of mercury, or salicylic acid, and in all the cases poroplastic or gutta-percha splints were moulded to the foot.

They all made excellent recoveries, with one exception in 1884.

This is noteworthy as an instance of a wound which my notes state was "full of pus" being rendered aseptic by one application of a very strong antiseptic solution.

A heavy iron box fell on the foot, causing a compound fracture of the great toe and a simple fracture of the second toe. The soft parts were greatly contused, and the jagged end of the upper fragment of the bone projected through the wound.

The fracture having been reduced, the wound was washed out with a solution of perchloride of mercury, and the skin purified with the same. Gamgee's absorbent gauze and wool tissue, prepared with a weak solution of the perchloride, was then applied, and a poroplastic splint moulded to the part. The wound became septic, the bone necrosed, and the toe was amputated at the metatarso-phalangeal joint, which was full of pus. The resulting wound was then washed out thoroughly with the spirituous solution of carbolic acid 1 in 5, and Lister's carbolic gauze dressing applied.

Two days afterwards the wound was quite aseptic, there being only a little serous discharge, and it remained so until it healed.

So rapid a change in the character of a wound cannot, I conceive, be obtained by any other method of treatment.

These were of every variety.

Two cases of wounds in which it was necessary to tie the radial artery are described amongst the operations.

In some of the punctured wounds in the neighbourhood of joints, the joints themselves appeared to be penetrated, but no attempt by probing, &c. was made to verify the diagnosis. Aseptic precautions were adopted, and immobility of the part secured by means of splints, with successful results.

The following case of lacerated wound furnishes a good example of the results of aseptic surgery, and I firmly believe that so good a result could not

Fracture of the os calcis of both feet.

Fracture of toes.

Contusions and wounds.

be obtained by any non-aseptic mode of treatment, more especially by the application of poultices, which appear still to be advocated by some eminent surgeons.

The case was under the care of Surgeon U. J. Bourke, M.S.

On the 10th of November 1885, W. B. was repairing a steam hammer, which was supported by a prop. The prop gave way, and the whole weight of the hammer fell on his left forearm and hand, causing the following injuries :

The forearm was burst open, a long lacerated wound extended along its anterior and inner surface from the junction of the upper and middle thirds nearly to the wrist. The muscles were torn away from each other, and the superficial ones reduced to almost a pulpy condition. There was but little hæmorrhage. The ulnar artery appeared to be injured and obliterated, there being no pulsation at the wrist, although it could be felt in the upper part of the wound.

Lacerated wounds of left arm and hand, and complete crush of a portion of the left thumb.

There was a deep lacerated wound, extending across the hand, from the ball of the thumb to the head of the metacarpal bone of the little finger, and the end of the terminal phalanx of the thumb was totally crushed.

At first sight, the soft parts appeared to be so terribly disorganised that amputation through the forearm appeared to be the only resource; but in consultation with Surgeon-Major W. D. Wilson, M.B., and myself, Surgeon Bourke decided to amputate through the terminal phalanx of the thumb, and to trust to free drainage and aseptic dressings to save the forearm. Chloroform having been administered, the thumb was amputated through the terminal phalanx; a counter opening was made on the posterior surface of the forearm, and large drainage tubes were inserted between the muscles.

The wounds were then thoroughly washed out with carbolic lotion, 1 in 20, and the edges brought together as much as possible, by position, but no sutures were introduced. A Lister's carbolic gauze dressing having been applied, the forearm was lightly bandaged, and he was confined to bed. The temperature that evening was 100° F. A morphia draught was administered at night.

November 11th. He slept well. Temperature 99·2° F. Felt no pain or uneasiness in the arm. There was considerable sanguineous oozing through the dressings, which were removed. The skin was then washed with carbolic lotion, 1 in 40, and a fresh gauze dressing applied. The carbolic spray was employed during the dressing.

November 14th. Scarcely any uneasiness, and no real pain since the accident. Temperature had not risen above 99·2° F. in the morning, and 100° F. in the evening. Had taken his nourishment well, consisting of milk and beef tea, and had slept well every night without draughts.

The wounds were redressed every day, under the carbolic spray, on account of sanguineous oozing, which soaked through the dressings. They remained aseptic.

November 16th. Temperature normal. Full diet allowed. Wounds quite easy, and no oozing through the dressing, which was not interfered with.

November 18th. No uneasiness in wounds, but serous discharge having appeared through the dressing, it was removed. Wound aseptic. Redressed as before. Temperature normal. Appetite good.

From this date he continued to progress most favourably, the wounds remaining painless and aseptic throughout the case.

Smaller drainage tubes replaced the large ones. They were shortened from time to time, and eventually left out altogether. The dressings became infrequent, only requiring removal every 5 or 6 days. The same dressing was employed throughout the case, until the wounds became quite superficial, when it was changed for boracic ointment.

December 4th. On this date the thumb had quite healed, and the hand and forearm were progressing in the most favourable manner. He now became an out-patient.

The commencement of January the wound of the hand healed, and that of the forearm was quite superficial.

During this month passive motion, douches, and friction were diligently employed with most excellent results.

He resumed his work on February the 4th, and at present he has perfect

use of every muscle of his forearm, which is as strong as it was before the accident.

Sprains.

None of these cases were of particular interest. The most successful treatment, in my opinion, in cases of sprains of joints is to envelop the affected part in the absorbent gauze and wool tissue advocated by the late Professor Gamgee, and bandage this on firmly. This tissue is most elastic, and distributes pressure very evenly. Over this a splint should be applied to secure immobility and perfect rest.

These should be removed much earlier than is usually done, even though some little pain on movement and tenderness are present, and passive motion, massage, friction, and douches diligently employed.

If this were done, many of the weak and painful joints, almost useless to the owners, which are generally due to long disuse and adhesions, would be avoided. These often drift, sooner or later, to bonesetters, who inform the patient that "a bone is out of place." They then break down the adhesions, and by subsequent passive motion, &c., obtain some of the wonderful cures we hear of.

Burns and scalds.

Although very numerous, but few cases presented points of interest.

One case, in which a piece of steel, at a white heat, penetrated the forearm and injured the radial artery, necessitating its ligation, is described amongst the operations.

The following case may be interesting as regards treatment:

P. Q., a lad about 17, slipped, and fell with his leg into a hole full of boiling water, in an engine room, and scalded it from ankle to knee. Deep sloughs formed on the ankle, and on the outer and inner surfaces of the lower third of the leg. Almost the whole of the rest of the skin, as high as the knee, was superficially implicated.

The accident occurred in January 1885, and during the next 6 months all kinds of remedies, as carbonate of soda, carron oil, carbolic oil, turpentine, boracic acid, zinc and lead lotions and ointments, opium and iron lotion, zinc plates, &c., were applied, accompanied by good nourishment, tonics, &c. But the wounds did not heal, and as his health began to break down, it became a question whether amputation was not the only resource left. On the 8th of August the treatment as described below was adopted, in consultation with Surgeon-Major W. D. Wilson, M.B., and the wounds at once commenced to improve. On the 28th of August he was discharged from hospital, and on the 15th of September he resumed work.

Treatment.

Every morning the leg was placed in a warm bath, to remove discharge, crusts, &c., and afterwards sponged over with a saturated solution of alum. It was then dressed for the day with a lotion composed of the tincture of the perchloride of iron and glycerine. Internally, he took a mixture of iron, chlorate of potash, and glycerine. Cod liver oil was also administered to him.

Injuries to the eye.

These constitute a considerable proportion of the accidents at the Arsenal, but during these two years no cases of any particular interest occurred.

The greater number were caused by chips of metal imbedding themselves in the cornea, and hardly a morning passed without our having to remove several of these by the spud or magnet.

Before the introduction of cocaine this was often a most tedious and painful operation. The natural sensitiveness of the eye was increased by the injury, and the least touch of the spud produced exquisite pain, causing the patient to flinch constantly, and in the case of a chip embedded in the deep layers of the cornea, it was a trial of patience on the surgeon's part, and of endurance on the patients.

These difficulties have now entirely vanished. Two or three drops of a 2 per cent. solution of cocaine are introduced into the eye, and after a few minutes the eye can be handled, and the spud used with the utmost impunity.

The 2 per cent. solution is quite efficient, and although it has been used here in hundreds of cases, no ill effects have followed in a single one.

For inflammation following these injuries, poppy head fomentations frequently renewed are most comforting and effective.

Hernia.

The cases of hernia were all of the inguinal variety, and were only placed on the Injury List for a day or two until suitable trusses had been fitted. These are supplied free when the rupture is sustained at work.

The following cases were allowed the benefit of the Injury List :

F. A., whilst at work, on the 12th November 1885, drank a considerable quantity of impure carbolic acid out of a tin where it was kept for disinfecting purposes. He stated to Surgeon-Major W. D. Wilson, M.B., under whose care he was, that he mistook it for his tea, and that he took two draughts before discovering his mistake. Carbolic acid poisoning.

On arrival at the hospital the mucous membrane of the lips, mouth, and fauces was much swollen, and covered with a white film, and he shortly afterwards became greatly collapsed.

Vomiting was excited by emetics, and a considerable quantity of carbolic acid brought up. Olive oil was then administered to him, and he was fed with iced milk. For the next two days the urine when voided was nearly black, and speedily separated into two layers, the heavy carbolic acid sinking to the bottom, thus showing that a very considerable quantity of the acid had been swallowed. It was present in the urine for nearly a week.

The mucous membranes ulcerated superficially, but he made an excellent recovery, and resumed work on the 24th of November, 12 days after the accident.

In this case the patient was working all one day up to his waist in water in a well. Next day he was suffering from symptoms of a chill, which were succeeded by a slight attack of pleurisy, from which he speedily recovered. Chill from immersion in a well.

These cases were all slight, and due to the nature of the patients' work. Lead poisoning.  
They were treated on ordinary principles.

#### OPERATIONS.

In 1884 and 1885 the operations performed at the Royal Arsenal, although numerous, were of little importance. A description of a few of the more interesting ones is subjoined.

The results of these operations were not encouraging, only one out of five being entirely successful, as far as the non-return of the disease is concerned. Removal of epithelioma.

In this case Surgeon-Major W. D. Wilson, M.B., excised a small epithelial wart from the skin over the left temple on the 19th of August 1884, and the man, who is still working in the Arsenal, has had no recurrence of the disease.

In another case Surgeon-Major Wilson removed a small superficial epithelial tumour from the centre of the lower lip. The glands did not appear to be implicated.

Nine months afterwards the patient returned with the submaxillary glands on the left side greatly indurated and enlarged. The cicatrix resulting from the operation was entirely free from the disease.

Owing to the extent that the glands were implicated, Surgeon-Major Wilson thought it unadvisable to attempt their removal.

At a London hospital, however, he was operated on, and we were informed that the wound resulting never healed, and that he succumbed eventually to the disease.

The third case, which was also a small epithelioma of the lower lip, was operated on by Surgeon-Major Stevenson, M.B., in 1884.

The disease did not return whilst the man remained in the Arsenal, but since he left, he died, I am informed, of "a tumour."

The fourth case, a description of which follows, was operated on twice by me.

R. B., age 45, when first seen in August 1884, stated that a growth had been removed from the middle of his lower lip at Charing Cross Hospital some months previously.

On the scar left by this operation was an indurated wart, superficially ulcerated about the size of a sixpence. The left angle of the mouth was occupied by a deep, indurated, ragged ulcer.

The submaxillary glands on the left side were very slightly enlarged, but the enlargement was so trifling that I hoped it was due to irritation only. On the right side they were normal. In consultation with Surgeon-Major Wilson, I decided to remove the smaller tumour at once, and when the wound had healed, the larger one, by a second operation. If I had removed the two growths simultaneously, freely incising the parts to avoid the danger of recur-

rence, the loss of tissue would have been so great as to necessitate a plastic operation.

On the 28th of August I removed the centre of the lip. This operation appeared to be successful, the wound healing in 10 days.

I then excised the angle of the mouth and a portion of the cheek, cutting widely beyond the diseased tissues. The wound resulting from this operation never healed.

Six days after the operation, slight induration made its appearance at the inner margin of the wound. This increased, and on the tenth day the indurated portion began to ulcerate and the submaxillary glands to swell.

The swelling increased rapidly. The skin became adherent and then broke down, a fungous mass protruding. From first to last he suffered hardly any pain. Shortly after this he proceeded to the Brompton Cancer Hospital, where he died on the 20th of December.

(a) Ligature of the left radial artery.  
(b.) Amputation of the left index finger.

On the 1st of October, W. P., age 49, was struck on the middle of the left forearm, immediately over the radial artery, by a sharp piece of steel at a white heat. This imbedded itself in the wound, and was extracted by his fellow workmen.

The wound was transverse, and its edges were charred and gaping. The radial artery was not exposed, and pulsated normally at the wrist.

The wound was treated aseptically, Lister's carbolic gauze dressing was applied, and the arm placed in a sling.

On the following day, October 2nd, all went well, but on October 3rd blood appeared through the dressings, and on their removal a jet of blood spurted from the radial artery.

The hæmorrhage was at once arrested by pressure from a finger in the wound, and a tourniquet applied to the brachial artery. The wound was enlarged, and after a little dissection, a longitudinal slit in the vessel was discovered, which was due to the separation of a slough caused by the vessel having been charred. The artery was tied above and below the slit with chromic catgut ligatures, and the wound dressed as before.

October 4th. On redressing the wound the radial artery was pulsating so violently in the neighbourhood of the upper ligature, that fearing secondary hæmorrhage, a tourniquet was loosely applied to the brachial artery, and the arm was raised on pillows.

October 5th. Pulsation, on this date, was totally absent from the radial, both above and below the wound, and also from the lower portion of the brachial artery.

The cause of this was found to be due to blocking up of the brachial in the situation where the tourniquet had been applied to it, and here the artery, for more than an inch, resembled a solid cord.

October 6th. Collateral circulation had established itself, and pulsation had returned in the radial above and below the wound. The inner side of the third phalanx of the left forefinger was dusky red, and exceedingly tender and painful.

From this date the wound of the arm proceeded most favourably, and gradually healed, but the low form of inflammation which had attacked the forefinger, and which was probably due to the temporary arrest of the circulation, progressed. In spite of free incisions and antiseptic applications, the tendons sloughed, the interphalangeal joints became disorganised, and the inflammation spread to the palm of the hand, which, likewise, was freely laid open.

October 11th. The forefinger, being totally disorganised, was amputated at the metacarpo-phalangeal joint. After this the case progressed favourably, and the wounds gradually healed. Some adhesions which had formed on the hand were broken down, and passive motion, friction, and douches diligently employed, with the result that, at present, but very slight stiffness and weakness of the hand remain. The arm is as strong as it ever was.

The features of interest in this case are :—

- (a.) The occurrence of hæmorrhage on the third day, which shows the necessity of caution in the treatment of this class of wounds.
- (b.) Obliteration of the brachial artery from pressure of the tourniquet, which, I believe, is a very uncommon occurrence.
- (c.) Sloughing of the index finger from deficient vascular supply.

The second case was admitted with a punctured wound of the middle of the forearm, which penetrated the radial artery. Ligature of the radial artery.

It was caused by a chip of metal flying off a hammer head.

A tourniquet having been applied to the brachial artery, the wound was enlarged and the vessel secured above and below the puncture. He made an excellent recovery.

These, the most numerous by far of our operations, present no cases of Amputation of fingers. special interest.

In most instances the operation was performed for accidents where the bones and soft parts were completely crushed; in others to provide covering for the bone where the part had been previously amputated by machinery.

One lesson learnt from these cases was to what a great extent Nature may be trusted to repair injuries, when aided by aseptic dressings. In the thumb and forefinger especially, every portion saved is of the utmost importance to the patient. I consider it, therefore, better to utilize for the flap, all soft parts which have a chance of life, and occasionally, even when sufficient flap cannot be obtained, to allow a small portion to granulate over in preference to amputating higher up. Even should the parts slough, this may be done later on.

In a few cases lately, in which part of the terminal phalanx has been sliced off, instead of amputating higher up, to procure covering for the bone, I have simply dressed the wound aseptically, and allowed it to granulate over. In the last case I treated this was hastened by applying a couple of skin grafts. I feared, at first, that the tips of the fingers treated in this manner would remain tender, and, therefore, useless for work. Such, however, is not my experience, for the results have been excellent.

The common extensor tendon to the middle finger of the right hand was divided by a transverse incised wound, a little above the metacarpo-phalangeal articulation. Suture of a tendon of the extensor communis digitorum.

As the ends of the tendon were considerably retracted, a longitudinal incision was made; they were brought into apposition and sutured together with chromic catgut. The wound was also closed with the same. The operation was performed aseptically, and the wound dressed with Lister's carbolic gauze dressing.

It remained aseptic and healed rapidly.

The tendon united firmly, and the patient regained entirely the power of extending his finger.

These operations were undertaken for the cure of varicose veins, and ulcers of the lower extremities. Ligature of veins.

They were all performed in the same manner, which is illustrated by the case which follows. All four were completely successful, the veins being obliterated and the ulcers cured. The operation and the treatment were almost painless. There were no complications and the cure was a rapid one.

This mode of operation contrasts, I consider, most favourably with one now in vogue in some London hospitals, viz., that of cutting down upon the vein and excising a portion. To accomplish this an anæsthetic is required, which increases the danger of the operation.

The wounds resulting are often very troublesome to heal.

The results do not appear to me to be superior in any way.

J. C., æt 52, was admitted on December the 29th with a large deep inflamed ulcer of the right leg, caused by a blow on the cicatrix of an old varicose ulcer.

The veins on the inside of the thigh and leg were enormously dilated. The coats were very thin, and just above the ulcer they appeared to be on the point of giving way.

The patient standing up to define the veins clearly, a mark was made on either side of them, at the points where it was proposed to introduce the pins.

Five harelip pins were then introduced. Two beneath the internal saphena vein in the thigh, and three in the leg, and a figure of eight was then applied to each pin, sufficiently tight to prevent the flow of blood through the veins.

Previous to the operation, the ulcer was purified with the strong spirituous

solution of carbolic acid, 1 in 5, and the operation was performed under strict aseptic conditions.

The ends of the pins having been cut off and small pads of gauze placed under the remaining portions, to prevent pressure on the skin, a large Lister's carbolic gauze dressing was applied to the thigh and leg, so as to include the whole of the punctures. It was secured at both ends by elastic webbing.

The patient was confined to bed.

December 30th. Dressing removed under carbolic spray, and replaced as there was no discharge. He had passed a good night and felt no pain.

January 5th. Slight uneasiness, but no pain. The dressing was removed under the spray. Punctures aseptic. All the pins were taken out and a fresh gauze dressing applied. The ulcer was much shallower and had healing edges.

January 9th. The punctures had healed and the ulcer was quite superficial and much smaller. Gauze dressings were left off, and boracic ointment applied to the ulcer. The leg was bandaged and he was allowed to sit up.

January 12th. On this date he was discharged from hospital and directed to attend as an out-patient. He suffered no pain throughout the case. The veins were obliterated and the ulcer all but healed.

He resumed his work shortly afterwards.

These, which are the most numerous of our operations, except amputations of fingers, were none of special interest.

They were usually rendered necessary by the toes being crushed by heavy weights falling on them.

Unlike similar operations on the fingers, I prefer to amputate in these sufficiently high up, to ensure the flaps being ample and quite healthy.

Firstly, they are of lower vitality than in the case of the fingers, and more prone to slough; and, secondly, loss of the part is of far less consequence.

In this case a very large abscess in the ischio-rectal fossa was opened, and was found to be only separated from the interior of the gut by the attenuated wall of the rectum.

Chloroform having been administered and a finger introduced into the rectum, a blunt pointed bistoury was passed through the fistulous opening and pushed through the thin wall of the gut on to the finger. This was pressed against the point of the knife, and the two withdrawn simultaneously dividing the sphincter on the way.

The wound was plugged with strips of lint soaked in encalyptic oil. This dressing was continued throughout the case, which progressed favourably to a successful termination, perfect power over the sphincter being regained.

Amputation of  
toes.

Fistula in-ano.

## APPENDIX No. XVIII.

## LIST OF OPERATIONS PERFORMED AT THE ROYAL VICTORIA HOSPITAL, NETLEY, DURING THE YEAR 1886, WITH SHORT ABSTRACTS OF THE MORE IMPORTANT CASES.

By **BRIGADE-SURGEON C. H. Y. GODWIN**, Medical Staff, Assistant Professor of Military Surgery.

Operations.	Number of Cases.	Diseases.	Results.				Remarks.
			Completely successful.	Partially successful.	Failed.	Died.	
<b>LOWER EXTREMITIES.</b>							
Forcible movement of knee.	2	Fibrous ankylosis	1	—	1	—	
Excision of 1st metatarsal and internal cuneiform bones.	1	Caries - -	1	—	—	—	
Sequestra removed	2	Necrosis of tibia -	2	—	—	—	
Diseased bone removed.	1	Caries of external malleolus.	1	—	—	—	
Partial excision of metatarso-phalangeal joint of great toe.	1	Suppuration and caries of bones of joint, following a suppurating union.	1	—	—	—	
<b>UPPER EXTREMITIES.</b>							
Amputation 1st phalanx of little finger.	1	An awkward stump.	1	—	—	—	
Wiring end of humerus.	1	Ununited fracture of humerus, lower third.	—	1	—	—	
Forcible movement of shoulder.	2	Fibrous ankylosis	—	—	2	—	Not improved.
Forcible movement of wrist.	3	Do. do. -	—	3	—	—	
Sequestrum removed.	1	Necrosis of shaft of clavicle.	1	—	—	—	Whole shaft removed, followed by a new bone formation.
Cavity laid open and diseased bone removed.	1	Caries of 4th metacarpal bone.	1	—	—	—	
Joint laid open and diseased bone removed.	2	Caries of left elbow joint after gunshot injury.	—	2	—	—	Both joints were stiff.
Sinus do. -	1	Necrosis following gunshot fracture of ulna.	1	—	—	—	
Wound laid open and diseased bone removed.	1	Necrosis of humerus following gunshot fracture.	—	1	—	—	Operation was successful, but the use of the arm was impaired.
Foreign body removed from carpus.	1	Bullet flattened out and impacted in carpus.	1	—	—	—	
Attempt to reduce old dislocation.	1	Unreduced dislocation of radius and ulna.	—	1	—	—	Position of bones improved.



Operations.	Number of Cases.	Diseases.	Results.				Remarks.
			Completely successful.	Partially successful.	Failed.	Died.	
<b>HEAD AND FACE.</b>							
Enucleation of eye	1	Gunshot injury -	1	—	—	—	Greatly improved.
Plastic operation -	1	Ectropion -	—	1	—	—	
Sequestrum removed	1	Necrosis of ramus of lower jaw.	1	—	—	—	
Do. do. -	1	Necrosis of cranium.	1	—	—	—	
<b>GENITO-URINARY.</b>							
Tapped -	1	Hydrocele -	—	1	—	—	Not cured.
Perineal section -	1	Stricture, urethra	—	—	1	—	
Circumcision -	1	Phymosis -	1	—	—	—	
Lithotrixy -	1	Calculus -	—	1	—	—	
Lithotomy, lateral	2	—	2	—	—	—	
<b>RECTUM.</b>							
Division of sphincter-ani and col-lateral sinuses.	5	Fistula in ano -	4	1	—	—	
Clamp and cautery	1	Hæmorrhoids, internal.	1	—	—	—	
Totals -	38		21	13	4	—	

In submitting a return of the operations performed in the Royal Victoria Hospital, Netley, during the year 1886, a short abstract of the more interesting cases is herewith given. The year has been, in a surgical sense, an uneventful one, as only a very few of the patients had met with their injuries in the field, and the class of cases, therefore, presented the character that would usually be met with in a large number of young men not exposed to extraordinary vicissitudes beyond such as are incidental to cantonment life in India, and in our foreign possessions generally.

In the treatment of wounds of all kinds the chief reliance has been placed in preparations of corrosive sublimate as an antiseptic, used both in solution and dry, as in the sal. alembroth wool and the similarly prepared "gamgee tissue."

These two latter preparations seem to provide a soft absorbent covering sufficiently impregnated with the most powerful germicide known.

They are easy of application, light as a covering, and efficient as a protection against germ life. Speaking generally, wet applications as dressings have not been used to the manifest advantage of the patients, but by the substitution of dry applications, whether of wood wool, salicylic, or boric wool, sal. alembroth wool or tissue, or even folds of absorbent cotton, the skin, up to the margin of the wound, is preserved in a healthier condition and its circulation is better maintained than when it is rendered flabby and atonic by the constant presence of wet dressings.

Private D—, age 23 years, R.W. Fusiliers, was wounded at the battle of Zeeidan, in Burmah, on the 27th December 1885. When in the act of charging a bullet struck him and entered the left chest wall,  $1\frac{1}{2}$  inches below the clavicle, and passing outward, downwards, and slightly backwards, thus passed below and in front of the shoulder joint; then shattering the shaft of the humerus, remained, and was afterward removed by a surgeon from the outer surface of the arm, 3 inches below the lower edge of the acromion. On his arrival at the field hospital some fragments of bone were removed, free suppuration set in, and pieces of bone continued to separate and come away. He arrived at Netley on the 27th April 1886, when he seemed to be in good health.

Gunshot fracture; necrosis.

On examining the wound, an irregularly elongated, oval, depressed scar was seen 2 inches below and 1 inch internal to the coracoid process of the left scapula. Another scar was seen on the antero-external aspect of the upper part of the arm, over the anterior border of the deltoid muscle, from whence the bullet had been extracted. About  $3\frac{1}{4}$  inches from the lower border of the acromion process, on the postero-external surface of the arm, there was a small ulcer, the outlet of a sinus running upwards and inwards to bare bone.

The upper half of the humerus was much thickened in its transverse diameter, and a probe passed into the sinus detected dead bone. On May 11th, æther having been given, a long incision was made through the sinus down to the bone, when several large sequestra were removed. During the operation, whenever the man struggled, the operator's finger was held quite tightly by the walls of the shaft of the humerus, which seemed to point to a longitudinal fissured fracture, the sides of which were separated when the muscles acted in spasm, and which came together again when the muscles were at rest. The wound was well washed out with 40 grains solution of chloride of zinc, a drainage tube inserted, and the wound dressed with iodoform gauze. The wound healed up most favourably, and he was discharged to his home on the 23rd August 1886.

Private R——, age 24, R.W. Fusiliers, was wounded in battle at Zeedan, Burmah, on the 27th December 1885. A bullet struck the tibia about 2 inches below the inner tuberosity on the inner and anterior aspect of the bone, and passing through the head of the bone made its exit posteriorly near but not implicating the head of the fibula. The wound bled freely at the time, and he lost all power of sensation in the leg below the knee. Several pieces of bone came away from time to time during his journey down country. He arrived at Netley on 29th April 1886, very ill and worn looking; his leg was flexed upon the thigh, and could not be straightened; on the inner and anterior aspect of the tibia, below its inner tuberosity, a sinus led into a cavity and communicated with an opening posteriorly and below the head of the fibula. The discharge was abundant and very offensive. The wound was well washed out with a lotion of chlorinated soda (1 to 10), which controlled the fætor better than any of the other antiseptic solutions. On the 7th May, æther having been given, the anterior sinus was freely laid open, and several sequestra with very offensive debris were removed; the cavity was well washed out with the 40 grains solution of chloride of zinc, and stuffed with iodoform gauze; the whole being well wrapped up in sal. alembroth wool, and the leg placed upon a McIntyre splint. After this the posterior wound at once closed, the leg became gradually straightened out, the large cavity in the head of the tibia filled up and eventually healed, and he gained the power of walking on the leg by the aid of a stick.

Gunshot wound of head of tibia; necrosis.

Private S——, age 25 years, Royal Berkshire Regiment, was wounded at Ginniss, on the Nile, on the 30th December 1885. When lying down, and in the act of taking aim, a bullet struck his rifle, and glancing off entered his left hand on the palmar aspect by the hypothenar eminence, and passing obliquely across the hand, emerged on the dorsal aspect between the thumb and forefinger; a first dressing was at once applied. He was eventually invalided, and arrived at Netley on the 6th April. At this time the wound had closed, but he had much pain and stiffness in the hand. On the 14th April something hard could be felt in the palm; it was cut down upon, and a small piece of lead extracted; this was followed by an attack of cellulitis. On June 10th the probe detected more metal, and upon Surgeon-Major Williamson enlarging the wound, he succeeded in removing a flattened piece of lead which had inserted itself between the bones of the carpus. The wound quickly healed, but the power of grasp was greatly weakened.

Foreign body in carpus.

Private B——, age 26 years, 3rd Dragoon Guards, fell on the evening of the 30th January 1885 into a drain and fractured his right humerus; the fracture was compound, inasmuch as one sharp point of bone pierced the skin, but the wound was very small and healed up directly. The arm was put up in splints of various kinds, but at the end of a year no union had taken place; he was invalided home, and arrived at Netley on the 23rd November 1885.

Ununited fracture of humerus.

On admission he seemed to be in excellent health in all respects; on examination of the arm an oblique fracture at the junction of the middle with the lower third of the humerus was at once apparent, and there seemed to be no callus or any attempt at union; the arm was, of course, quite useless, and, in fact, a great encumbrance to him; every variety of treatment had been tried, including friction between the ends of the bones, fixed immovable bandages, &c., besides all kinds of tonics; there did not appear to be any trace of scurvy.

On the 19th January 1886, æther having been given, and an Esmarch's bandage duly applied, a free incision was made down to the bone through the triceps muscle. The lower end was easily turned out and resected, but the upper end required great force to disengage it from the brachialis anticus muscle, into which its pointed extremity had become firmly embedded. When quite freed the end was also resected in such a direction as to enable the ends to come together; both ends were now drilled, and a stout silver wire passed through and fastened up tight, and the ends were then bent down upon the bone. The wound was well washed out with a 1-20 carbolic solution, all bleeding points picked up, drainage tubes inserted, and the edges of the wound brought together by sutures and the arm packed up in a gauze dressing. A Gooche's kettle-holder splint was fixed round the humerus, and the whole arm and forearm supported upon an angular splint. The wound healed up readily, and by the 28th January it had united firmly, except where the drainage tubes had been, this place, however, quickly healed. On the 16th February the humerus was found to be united, though the medium seemed soft and yielding.

On the 23rd the arm was much firmer, and could be raised by the patient; the elbow joint was gently moved, and the arm replaced in a splint. March 26th, note says muscular development in active progress, but union not firm at present. A sinus now formed which led down to the wire; this, May 11th, was therefore removed.

The union after this seemed to become firmer, and the patient could raise the arm alone by its own muscles above his head.

To try and get a perfect union the arm was now once more put up in a gum and chalk splint, and kept so for four weeks; on removing this casing, on July 20th, the arm was found to have gone back, the muscles had wasted and the union between the end of the bones seemed more yielding. He left at his own request on the 24th August. The progress in this case was most disappointing, at first good union promised to be the result; but the callus became absorbed, and though the arm was improved yet he left the hospital with that which seemed likely to prove a false joint.

Private C——, age 25 years, 2nd Royal Munster Fusiliers, when out shooting in India on the 10th November 1885, with comrades, was struck on the right eye by a shot, which led ultimately to his being invalided home. He arrived on the 19th April 1886, when it was observed by Surgeon-on-Probation Hudson that there was shrinking of the right globe, there was also a small pigmental cicatrix on the vertical meridian  $\frac{1}{2}$ " from the margin of the cornea, just behind the ciliary region, with general congestion of the sclerotic; the cornea was normal; iris was prolapsed into the wound; lens not opaque, no details of fundus visible; all power of sight quite lost.

It was thought that the shot had penetrated and still remained in the globe, and, therefore, it was considered advisable to remove it, which was done in the usual manner.

After the removal of the globe, on making a section, two small shots were found quite close together encased in a common capsule of fibrous tissue. Both shots must have entered through the one aperture in the sclerotic.

The wound healed favourably, and yielded a capital bed for the glass eye.

Private H——, age 22 years, 2nd Battalion, Scottish Rifles, stated that he had been stung on the right cheek by an insect in April 1885, which was followed by abscess and erysipelas; the contraction of the scar dragged down the lower lid, so that it was almost entirely everted, and the mucous membrane exposed up to its angle with the lower surface of the eye-ball. For this he was invalided from India, and arrived at Netley on the 19th April 1886.

On the 15th June he was placed under æther, when the outer third of both

Enucleation of  
eyeball.

Ectropion.

lids of his right eye just internal to the lashes were pared up to the outer canthus and then united by three fine sutures, which drew the raw surfaces accurately together and thus raised the lower lid; a V-shaped incision was then made in the cheek, and the piece of skin dissected up to the lower border of the orbit so as to free it from all connexions, and thus allowed the lower lid to come up to the eye in its normal place; the sides of the incision in the cheek were closely approximated by hair-lip pins, which thus pushed up the flap, the sides of which were now accurately stitched to the cheek.

The wound united quickly and well, but a point of suppuration followed one of the needle tracks. The eyelids looked now quite natural, but the two lids were left united until the wound in the cheek had soundly healed, and the parts recovered their natural softness and mobility. Then the union between the outer thirds of the two lids was divided.

The man gained greatly by the operation, which was by a modified Wharton Jones' method, but the lower lid still showed a tendency to drop away from the eye, though without the disfigurement which at first existed.

Private R—, age 19 years, Cheshire Regiment, when serving in Egypt in February 1886 found that riding horses and mules shook him a good deal, and in March he noticed his water to be thick, and that the act of micturition caused him pain; he then began to suffer from irritability of the bladder and an increasing difficulty in micturition. These symptoms increased and caused him to be invalided home in the month of July. On arrival at Netley on 28th July 1886 he had a very delicate appearance and suffered great pain in the hypogastrium and from irritability of the bladder, the urine was loaded with muco-purulent deposit, and often with blood. Lithotomy.

In September he was seized with intense strangury, pain in the urethra and penis, and the urine was highly blood stained. His condition was so serious that on the following morning a lithotrite was passed and the calculus crushed; but his bladder was so irritable that it was not thought prudent to attempt to get rid of the debris with one operation. For some days after this he continued very ill and passed a great deal of blood.

On the 14th October, when he had greatly recovered himself, lateral lithotomy was performed, and fragments of a calculus weighing 884 grs. were removed, the bladder was washed out with boracic acid lotion and thoroughly cleansed.

His recovery was slow but steady, the wound healed, leaving a fistula which was long in closing up. It eventually healed, and he left the hospital cured.

The calculus has a lithic acid nucleus, but the outer shell consisted of soft friable phosphates with oxalate of lime.

Private C—, age 20 years, Worcestershire Regiment, commenced in August 1885, after an attack of gonorrhœa, to notice that his urine was thick, and deposited a ropy stuff after standing which was offensive in odour; he had a difficulty in micturition, sometimes even to retention, and now began to pass blood. He continued to suffer pain in the hypogastrium and glans penis. The symptoms increased in severity, and led to his being invalided in September to England, and arrived at Netley on the 17th November 1886, when a stone was detected by a sound. On December 2nd lateral lithotomy was performed, and a stone weighing 706 grs. removed. Lithotomy.

December 9th the urine began to come by the natural passage, and he made a good and rapid recovery, and left the hospital for his home with the parts healed on the 25th January 1887.

Sergeant-major McK—, age 40 years, Royal Engineers, suffered in the autumn of 1886 from a painful bunion, which suppurated and led to inflammation and suppuration of the metatarso-phalangeal joint, for which he was invalided and sent to England from Gibraltar. Partial re-section of metatarso-phalangeal joint of great toe.

He was admitted into Netley Hospital on the 10th October, when he was found to have a sinus extending into the joint, and a probe gave evidence of diseased bone.

On the 15th December a free incision was made into the joint, the ends of the bone (first metatarsal and first phalanx) were scraped away by means of a Volkman's spoon and a gouge, and all diseased tissue removed; the cavity was then washed with the 40 grs. chloride of zinc lotion, and the wound

dressed with sal. alemborth wool, and the whole foot supported in a gutta-percha mould. The wound quickly healed up, the swelling subsided, but the part remained very painful, especially at night. He was placed on a course of gout medicine, and belladonna liniment locally applied; under this treatment he improved, and now he is able to walk about with a boot on the foot, and there is a limited power of movement between the two bones which removes the stiffness in the gait that a bony ankylosis would have given.

---

## APPENDIX No. XIX.

## REPORT ON AN OUTBREAK OF DIPHTHERIA IN THE NEIGHBOURHOOD OF THE ROYAL MILITARY COLLEGE, OCTOBER AND NOVEMBER, 1886.

By Brigade Surgeon ALFRED F. S. CLARKE (Retired).

A serious outbreak of diphtheria prevailed in the villages of Yorktown, Camberly, and in adjacent parts of Frimley Parish, in October and November of this year, attacking chiefly the families and domestic servants of officers, retired officers, and civilians living in these places, and therefore in close proximity to the Royal Military and Staff Colleges. The total number of cases between the 11th October and the 14th November was 88. Of these 15 died; two other deaths took place in children whose parents had taken them away to avoid the complaint, and one child died at Brighton from nephritis while convalescing from an attack, so that the total deaths due to the outbreak were 18.

The cases were treated by the civil practitioners, who were the ordinary medical attendants of the majority of the families, and by the medical officers of the Royal Military College.

Before describing the epidemic itself, it will perhaps be advantageous to say a few words regarding the locality where the disease prevailed. Yorktown and Camberly are long straggling villages merging into one another, and running almost due east and west from Blackwater along the main London Road towards Bagshot, passing immediately in front of the grounds of the two Colleges, which for a considerable distance form their northern boundary. The principal street of Yorktown is composed chiefly of shops, artisans houses, and cottages; a few villas of the better class are dotted irregularly about; whilst Camberly, which is of more recent date, in addition to shops and cottages, possesses a large number of villas and houses of a more pretentious character. Camberly is more undulating than Yorktown, some of the ground being 400 feet above sea level. It is well wooded with Scotch fir and pine, and of late years its picturesqueness and situation have caused it to be much sought after for building sites, large handsome residences having been erected towards Bagshot and the adjoining village of Frimley. A large number of villas are rented by married officers of the Staff College, whilst many servants of both Colleges occupy the smaller houses and cottages. The prevalence of epidemic disease in these villages would, therefore, be of serious matter, not only from the immediate consequences to the inhabitants, but from other contingencies which might arise, such as the breaking up of these two important military establishments, with the inconveniences that would attend such a course.

The population of the district has increased very considerably the last few years, and of the villages we are considering may be taken as, Yorktown, 1,500 to 2,000, Camberly not quite so many, the two together about 4,000.

The soil of the district is almost entirely Bagshot sand over beds of London clay. Gravel is abundant. The subsoil water lies at varying depths from 6 to 30 feet; generally speaking, water is abundant at 10 to 12 feet.

The district has hitherto enjoyed very good health, the dryness of the soil, the facilities for natural drainage, the large extent of pine forests giving it a character for salubrity, especially for chest diseases, residence in the pine woods of Camberly often being recommended for consumptive cases. It is true that in the valley of the Blackwater, extending from Ash, Frimley Green, and Farnborough towards Yately, diseases of a zymotic character have from time to time been prevalent; these, however, were generally attributed to the insanitary condition of the Blackwater river, which for many years had, it is stated, received sewage from the town of Aldershot, and also to the general low lying, swampy character of the valley, heavy rains causing large tracts of

Locality.  
Population.  
Soil.  
Health of the district.

it to be constantly submerged. It may be taken then that previous to this outbreak the general health condition had been good, although with such a large population, and with constant communication with Aldershot and the other villages referred to, it was to be expected that occasional cases of scarlet fever, typhoid, &c., should crop up; nothing, however, in the form of an epidemic had occurred for many years in Yorktown or Camberly. The registrar of one district informed me he had not, up to October, registered a death from infectious disease in 1886. Returns from the other district (Farnham Union), although applied for, have not been furnished. During the spring and summer months scarlet fever of a mild type had hung about the neighbourhood, two or three cases being admitted into the fever hospital of the Royal Military College. Isolation had invariably prevented it from spreading, and in no sense could it be termed "epidemic."

The drainage of the villages cannot be called satisfactory; up to two years ago no general system of sewerage prevailed, cesspits good and bad, chiefly bad in the smaller houses, existed universally. In 1884 a drainage system sanctioned by the Local Government Board was adopted, and is now in working order. It takes the greater part of the village sewage, commencing at the east end of Camberly, collects a large section of the Yorktown houses, and terminates in a sewage farm in the Frimley Road; the houses that lie back some distance from the road are not, as a rule, connected with these sewers, but have their own waterclosets, privies, and cesspits. I would observe, too, that the drainage and sewage farm of the two Colleges are quite distinct from that of the villages. Reference to the accompanying map will illustrate the drainage system more clearly than further description. Although this drainage is in working order, I cannot but acknowledge that it has many faults; the flushing is exceedingly defective, the "fall" in many parts inadequate, and the ventilation scanty.\* Considering the extent and length of the sewers, and the number of houses draining into them, a large flow of water at several points, and especially where junctions at a very sharp angle occur, is essential to keep them properly flushed, the means of doing this at Camberly can hardly be said to exist; there is one flushing tank filled by a hand pump, and after considerable labour 1,000 gallons of water is twice a week discharged into the head of the main sewer; while a primitive tub on wheels filled with water from adjacent cottages is emptied at various manholes on the line of drainage, as the cottage water supply for many months in the summer is very scanty, it is obvious that this flushing is more nominal than real. Blocks and stagnation of sewage matter in the drains are sometimes complained of, as are constant bad smells at manholes and other places.

The water supply of the villages is entirely from wells, and, as stated before, in the summer is often very scanty. The water itself is of a fair character, containing a large amount of vegetable organic matter, but with proper filtration it may be regarded as wholesome. Many of the better class boil as well as filter their drinking water.

With these few preliminary remarks on the locality attacked by diphtheria, we will pass on to the outbreak itself. The first cases occurred on Monday, October 11th, when two children of a Major B——, living in Yorktown, and the wife of an officer of the Royal Military College, living in "the Terrace" of the College, were attacked; these were followed in rapid succession by many others in houses situated at distances varying from  $\frac{1}{2}$  to 2 and 3 miles from one another, and without any regularity as to attack; the map shows how they were dotted about the district, some on the main road, and, therefore, in propinquity to the sewers; others distant as much as  $1\frac{1}{2}$  miles from them, with, in some cases, hills and woods intervening. For 10 days the outbreak raged with much severity, during the first week upwards of 60 cases and 10 deaths had occurred. At the end of a fortnight it began to decline, a few dropping cases continued till the end of the following month, one death being registered on the 10th November, but the violence of the storm had passed off by the latter end of October. The outbreak though short was very severe, attacking more than 40 houses of the better class, the poorer community escaping almost entirely; their cases were milder, only one death occurred amongst them, with

\* Since this was written new ventilators for the main sewer have been constructed.—A.C.

the exception of a domestic servant, in the house of a lady whose child was attacked. The type of the disease may be characterised as virulent, children previously in good health were struck down and succumbed in three, four, and five days, the mortality amongst children was in a far greater ratio than amongst adults; the stronger frame of the adult, and the co-operation he is able to lend in the medical treatment of the case, doubtless contribute to this result.

The symptoms showed much similarity, a short premonitory invasion of malaise, with slight febrile condition, followed in from 12 to 24 hours by sore throat, rapid development of the diphtheritic membrane on the tonsils and pharynx; infiltration of submaxillary and cervical glands, foetid discharge from nose and mouth, great prostration of the nervous system, albumen in the urine, collapse and death from general exhaustion of the vital powers. One child died from sudden failure of the heart. In few cases was the respiration affected so that tracheotomy was called for. It was performed twice only, and each case ended fatally. The temperature never rose to any great height, 103° the highest point recorded; it generally ranged from 100° to 102°; the pulse was always rapid and feeble, sometimes irregular and intermittent; consciousness, as a rule, was retained till a few hours before death. The treatment commonly pursued was to spray the throat with sulphurous acid (1 in 6) every hour or two; the throat was brushed with lactic acid or liq. hyd. bichlor.; a consensus of opinion of the medical men in attendance, as well as of Deputy Surgeon-General Marston, Drs. Broadbent, Cayley, and Sydney Ringer, who were in consultation during the epidemic, was adverse to the application of strong acids or caustics to the throat. Internally the sulpho-carbolate of soda with ammonia, quinine, large doses of tinct. ferri, sesquichlor., sulphur suspended in syrup, seemed to be the most useful remedies; good nursing was imperative; fluid food in the form of milk, animal broths, Brand's Essence, peptonised foods were given freely and at short intervals; with children it was more important to feed and to sustain the powers of life than to rouse their opposition with nauseous drugs. One lesson this outbreak taught us was the necessity of stimulants. Even to children, the disease attack is so sudden and powerful it requires to be met by vigorous measures, and alcohol in some form is demanded "ab initio." Diphtheritic paralysis was observed in three cases; in the majority of the recoveries convalescence was rapid. No post-mortem was obtainable.

In searching for the cause or causes of the outbreak, our attention was naturally directed, first, to insanitary conditions, general or individual, connected with either drainage or water supply. Secondly, to contagion of a personal nature. Thirdly, to infection by articles of food, such as milk, which past experience has demonstrated to be a fertile cause or carrier of diphtheria. The first two elements, water supply and drainage, were at once eliminated from our investigation, because, as the map indicates, less than half the infected houses were connected with the village sewers. It was also beyond probability that the waterclosets, drains, and cesspits of the remaining number had all got out of order within three or four days, and not only out of order, but were one and all in a condition to originate with such rapidity cases of diphtheria. Contamination by water was, for similar reasons, "put out of court," there being no general water system, and the chances of 40 to 50 wells, widely scattered from each other, being spontaneously and simultaneously tainted with the germs or micrococci of diphtheria could not be entertained. The question of personal contagion hardly required thought. No case of diphtheria had occurred in either Yorktown or Camberly for many months, whilst the sudden invasion and widespread area of the outbreak dissipated this theory, even had there been a case which otherwise might have been regarded as the starting point. Except the village ones, there are no large schools or general meeting place for children or adults; another argument against the contagion theory. Coming to the third point, food supply, we were met here by the fact that there was no community of supply. There are half-a-dozen butchers getting their cattle from different sources, more than that number of bakers and grocers, whilst many families deal largely with London for food generally. On examining, however, the question of the milk supply, we were startled to find it reported that without exception every house and even cottage where diphtheria had occurred had obtained their milk from one dairy

Symptoms.

Treatment.

Causes of the epidemic.



farm; with this before us inquiries were set on foot to verify the fact and to endeavour to trace out the actual cause of the milk infection. The neighbourhood depends for its milk on the supply of many dairies and farms, of the latter one of the largest was a farm on the Frimley Road, owned by a "Mr. H.," and whose customers were largely amongst the better class of inhabitants. I append a Table A., which the owner of the dairy furnished me with, giving the list of his customers, those in whose houses diphtheria appeared are marked with a cross. It will be seen at a glance that the number of houses of the better classes attacked was out of all proportion to those which escaped; also that the disease was much more extensive amongst them. To facilitate reference this dairy farmer will be known as "Mr. H.," and in justice to him I should like to mention that he was extremely obliging in affording all information, giving ready access to his premises, furnishing specimens and analysis of his water, in fact, he appeared exceedingly anxious to throw all the light he could on the subject.

Further investigation very shortly justified us in coming to the conclusion that infected milk was the *sole* cause of this outbreak. This inference was drawn from, first, the fact that the whole of the infected houses obtained their milk from this one source; reference to the map and to Table B. attached shows that houses adjacent to the diphtheritic ones, subject to like conditions of site, soil, water, air, and drainage, but obtaining their milk from a different service, had no case amongst them. Second, by collateral evidence of minor facts, which by themselves would not have been of great weight, but which when added to the former strengthen the case to almost absolute certainty; a few of these may be mentioned.

Collateral evidence.

(a.) A lady, Miss B. H., whose family obtained their milk from another source, went to lunch on the 9th October, with Mrs. B., whose milk came from the dairy under suspicion; she drank two tumblers of this milk at luncheon, 36 hours afterwards she was down with diphtheria, and was the only member of the household that had it.

(b.) The gardener of this family, living in a cottage outside, and not drinking milk from his master's source, but getting a small quantity daily from this dairy, "Mr. H.'s" contracted diphtheria on the 14th October.

(c.) At Captain B.'s, on the night of the 11th, a tumbler of milk, left by the children, was sent down to the servants; one had cocoa without milk for her supper, the other drank this tumbler and sickened two days after with diphtheria.

(d.) At General M.'s the servants commonly drank skimmed milk, but a housemaid, who had the disease, confessed that she was very fond of milk and constantly drank some from the jugs—the other servants escaped.

(e.) Mrs. C., whose house was supplied from a different dairy, had tea on the afternoon of the 8th October, with a lady dealing with "Mr. H." She took a good deal of cream and milk, next day had sore throat with rigors, she dosed herself with quinine and port wine, and the attack passed away.

(f.) A milk boy, employed by "Mr. H." but who lived half a mile off at Frimley, and did not get milk from the dairy, was given some milk on two occasions by "Mr. H.," when, owing to his customers falling off, he had plenty to spare, this boy's sister developed diphtheria, he and four others in the house took the complaint a few days later, one child dying. Whether this boy had habitually taken home small quantities of milk left over cannot be proved, but it may be looked on as more than a possibility. Again, the number of cases in the better classes being out of all proportion to the poorer, *vide* Table A., is accounted for by the fact that the poor man buys daily only a small quantity, a pennyworth or less of milk, uses a portion in his tea, and the rest is made into a pudding for the children; they too generally buy skimmed milk which has often been scalded.

Causes of the outbreak.

Having arrived, then, at the conclusion that milk from this one dairy was the "*fons et origo mali*," the next point was to endeavour to discover how the milk itself became infected. With this view a visit was paid to the dairy farm by Deputy Surgeon-General Marston (who came from London on the 20th to inquire into the outbreak) and myself. Later on a careful investigation of the whole surroundings of the dairy was made by my colleague, Surgeon E. L. Maunsell, and myself. The sanitary condition of the

dairy as a whole appeared good; the cowsheds were well built and ventilated; the dairy proper exceedingly clean; the water used for washing the milk cans was obtained from a well outside the house, and was stated to be always boiled before being used for this purpose. There were no waterclosets, an earth closet carefully attended to being the conservancy arrangement for the house; the house slops were emptied some distance away into the garden; the only drain was from a scullery sink, disconnected, and leading to a small running stream on the north side of the house; the farmyard contained the usual amount of manure, solid and liquid, but had no drain to carry off the latter; the cows appeared to be healthy, and Professor Axe, of the Veterinary Department, who had twice inspected them, certified as to their health condition, though Dr. Power, who is making an inquiry into the outbreak under instructions from the Local Government Board, informed me that two cows had some sores and suspicious-looking ulcers on their udders and teats. Professor Axe did not, however, consider these of any importance as evidence of sickness in the cows. The organization of the dairy in regard to the collection and distribution of the milk was inquired into. The health of the household and of the farm employes was next the subject of scrutiny. I visited the houses of *all* connected with the dairy to trace any sickness amongst them or their families; all were in good health, and no infectious complaint existed in any; one boy employed as a milk carrier had so far back as June suffered from scarlet fever, but he had been kept away till the doctor in attendance, Mr. H. Manders, F.R.C.S., certified he could return with safety. A case of diphtheria had occurred in July in some cottages at Frimley Grove, more than a half mile from the dairy, and in no way connected with it. So far then this evidence was all negative.

Causes of the outbreak.

The condition of the Blackwater river, which flows at the bottom of "Mr. H.'s" fields was not forgotten; this river had not been cleaned out for 20 years, and was known to be in a very foul state. Recently the local authorities decided on cleaning it, and when I inspected the portion near "Mr. H.'s" quantities of filthy black mud were found heaped up on the banks. The cows, however, did not drink from the Blackwater, nor had they been allowed to graze in the fields in its vicinity for many months. The water of the well and of the stream from which the cows habitually drank had been analysed by Dr. Stevenson, of Guy's Hospital, on behalf of the owner, and was pronounced to be "good and free from sewage contamination." Thus far our inquiry had produced only barren result, and it seemed as if we should fail in tracing out any condition on which we could rely with anything like certainty as to the actual source of the milk infection.

The authorities of the Farnham Union in whose district the outbreak chiefly occurred had, however, sent on their own account specimens of the well water to be analyzed at Southampton by Dr. Angell; his analysis differed materially from that of Dr. Stevenson; he summed up his report on the water as follows:—"This water is dangerously polluted, and quite unfit for cleansing dairy utensils." With this conflict of opinion on such an important element in our investigation before me, I obtained the sanction of the Director-General to send samples of the water to Professor de Chaumont at Netley, so that a third and independent analysis should be obtained; this reached us last week, it confirms that of Dr. Angell, condemns the water most strongly, the summing-up stating "this water is very impure and quite unfit for use; there is strong probability of its having been contaminated with sewage."

Whence the well water obtains this sewage pollution is not perfectly clear; it may be by leakage from an old disused cess-pit situated close to the well, and which was supposed to have been filled up four years ago, when the water-closet was abolished and the earth closet supplied; in the absence of other evidence it is more than probable that such was the case.

Brushing aside, then, other theories as to the milk infection in this outbreak, we have an established fact that the water used for washing the milk cans was "dangerously impure and polluted with sewage," it is also just possible that the milk *may* have been diluted with this water by some servant or employe of the dairy. Previous to the outbreak the weather had been unusually warm, the first week in October particularly close and sultry—the thermometer in the shade reaching on the 4th 72° on the 5th 73°—this was followed by a heavy

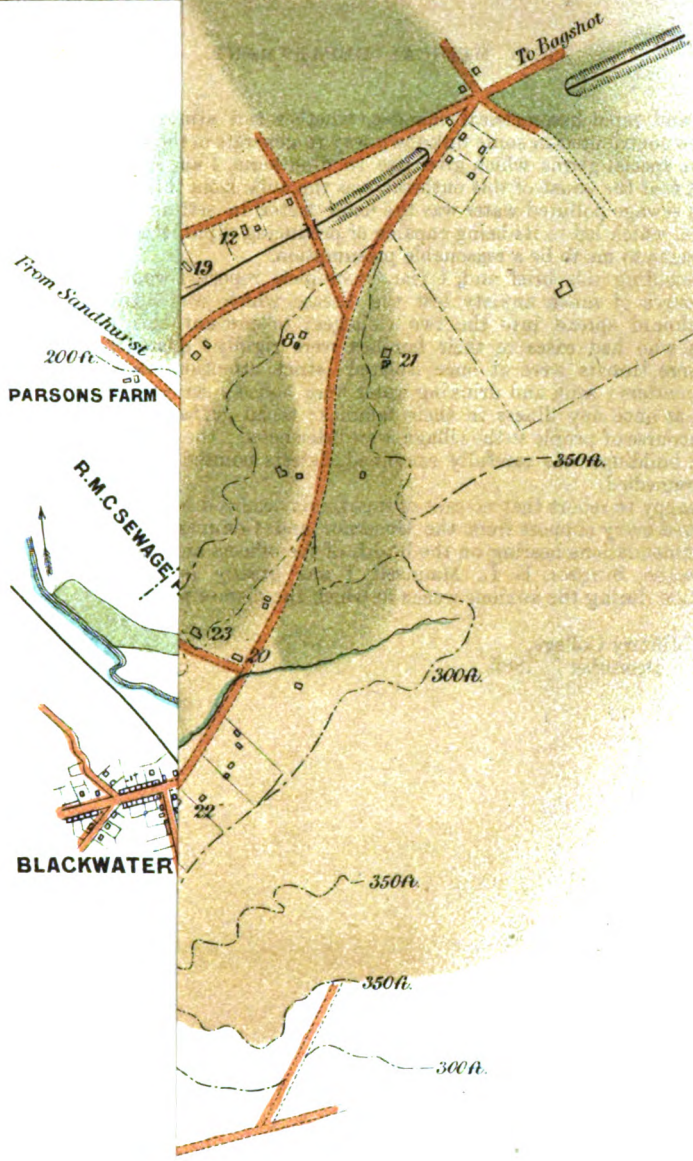
rainfall and rapid barometrical changes, whether this atmospheric condition may have contributed in some unknown way to generate in the sewage polluted water the special germs which give rise to diphtheria, I am not prepared to say; but that the cause of this outbreak was the milk from this one dairy, and that this sewage polluted water was the main factor in setting up changes in that milk, which led to its being capable of producing diphtheria in the human frame, seems to me to be a reasonable presumption.

In concluding this brief and, I fear, incomplete report, I would add that it was a source of much anxiety lest the disease, which was literally "at our gates," should spread into the two Colleges; to prevent this, officers and employes who had cases in their families were rigidly "quarantined;" suspicious sore throats were at once isolated; strict attention was paid to all sanitary matters; milk and drinking water were boiled; servants were warned to report at once any illness in their families; social gatherings, bringing a large concourse of people to the village, were interdicted; the sanitary condition of all the buildings was carefully examined, defects pointed out, and as far as possible remedied.

I am happy to report that no case of diphtheria occurred in either College.


I received every support from the Governor and Commandant in carrying out recommendations bearing on the health of the officers and cadets, while to my colleague, Surgeon E. L. Maunsell, I was greatly indebted for ready co-operation during the anxious weeks in which the disease prevailed.

Royal Military College,  
December 7, 1886.



*The Numbers refer to houses attacked  
in Chronological order.*

 *Upper Bagshot Sands  
Sand & Gravel, very porous.*

 *Lower Bagshots  
Sand with bands of Clay.*

 *Main Sewers.*

Scale  
100 0 100 200 300



TABLE A.

Houses supplied with Milk from Mr. "H.'s" dairy. Cases of diphtheria marked with a +.

1	Captain F.	+	23	Dr. S.	+
2	" B.	+	24	Captain R.	+
3	Mrs. M.	+	25	Mr. F.	+
4	Lady W.	+	26	Mr. D. E.	+
5	General P.	+	27	Mr. C.	+
6	Dr. S.	+	28	Major F. (family away from home):	
7	Captain T.	+	29	Colonel R.	+
8	General M.	+	30	Captain T.	+
9	Mrs. M.	+	31	Mr. V. B.	+
10	Captain S.	+	32	Captain B.	+
11	Colonel O.	+	33	Colonel D.	+
12	Colonel B.		34	Captain A.	
13	Mr. C.		35	" K.	
14	Captain O.'s	+	36	Captain B.	+
15	Mrs. H.	+	37	Mr. K.	+
16	Captain L.		38	Mr. L.	
17	" P.		39	Captain W. B.	+
18	Mr. M.	+	40	Colonel S.	+
19	Major R.	+	41	Mr. W.	
20	Mrs. E.	+	42	Miss G.	
21	Colonel R.		43	Mrs. S.	+
22	Major B.	+			

Cottages and artisans' houses supplied with milk from same dairy. Cases of diphtheria marked with +.

1	Mr. A.	+	26	Mr. M.	
2	" M.		27	" C.	
3	" S.		28	" L.	
4	" E.		29	" N.	
5	" S.		30	" F.	
6	" S.	+	31	" S.	+
7	" B.		32	" B.	
8	" H.		33	" F.	
9	" D.		34	" D.	
10	" A.		35	" M.	
11	" L.		36	" M.	
12	" H.		37	" P.	
13	" H.		38	" R.	
14	" A.		39	" M.	
15	" P.	+	40	" I.	
16	" E.	+	41	" R.	
17	" Y.		42	" D.	
18	" B.	+	43	" C.	
19	" B.		44	" K.	
20	" S.		45	" K.	
21	" M.		46	" T.	
22	" M.		47	" K.	
23	" D.		48	" S.	
24	" D.		49	Captain B.'s coachman.	
25	" O.		50	Mr. C.'s	"

This table shows how the houses of the better class suffered out of all proportion to those of the poorer population.

TABLE B.

This Table exhibits the cases and deaths from diphtheria in households supplied with "H.'s" milk, contrasted with households in close propinquity but obtaining milk from other sources.

Households.	Milk from H.'s dairy.	Milk from other sources.	Cases of Diphtheria.	Deaths.	Remarks.
Captain B. - -	Yes.	—	1	—	
Captain A. - -	—	Yes.	—	—	
Colonel D. - -	Yes.	—	4	2	
Rev. M. - -	—	Yes.	—	—	
Dr. T. - -	—	Yes.	—	—	
Captain P. - -	—	Yes.	—	—	
Captain T. - -	Yes.	—	1	—	
General M. - -	Yes.	—	2	—	
General P. - -	Yes.	—	2	—	
Dr. S. - -	Yes.	—	4	3	
Captain F. - -	—	Yes.	—	—	
Captain S. - -	—	Yes.	—	—	
Colonel O. - -	Yes.	—	1	—	
Dr. A. - -	—	Yes.	—	—	
Major W. - -	—	Yes.	—	—	
Colonel B. - -	—	Yes.	—	—	
Captain O.'s - -	Yes.	—	5	1	
Mrs. S. - -	Yes.	—	2	—	
Mrs. K. - -	Yes.	—	2	1	
Captain B. - -	Yes.	—	2	—	
Mrs. H. - -	Yes.	—	1	1	
Colonel H. - -	—	Yes.	1*	—	
M B. - -	—	Yes.	—	—	
Major R. - -	—	Yes.	—	—	
Major B. - -	Yes.	—	0	1	These houses are situated close together.
Mrs. E. - -	Yes.	—	2	—	
General P. - -	—	Yes.	—	—	
Captain K. - -	—	Yes.	—	—	
Mr. C. - -	Yes.	—	2	—	
Colonel R. - -	Yes.	—	1	—	
Major C. K. - -	—	Yes.	—	—	Houses near each other.
Mrs. M. - -	Yes.	—	1	—	
Captain W. - -	—	Yes.	—	—	These three houses next door to each other.
Major C. - -	—	Yes.	—	—	
Captain B. - -	Yes.	—	3	2*	Died in Dublin.

\* Exceptionally partook of "H.'s" milk at a friend's house.

Households.	Milk from H.'s dairy.	Milk from other sources.	Cases of Diph- theria.	Deaths.	Remarks.
Mr. D. E.	-	Yes.	—	2	1
Captain R.	-	Yes.	—	3	1
Mrs. F.	-	Yes.	—	1	—
Mr. V.	-	Yes.	—	3	1
Major R.	-	Yes.	—	5	—
Captain F.	-	Yes.	—	2	—
Dr. M.	-	Yes.	—	2	1
Captain L.	-	Yes.	—	1	—
Dr. M.	-	—	Yes.	2	1*
Mr. C.	-	?	Yes.	6	1†

These houses are scattered  
at distances varying from  
a quarter to three-quarters  
of a mile from each other.

\* This case occurred after the outbreak had all but declined, and was thought to be due to contagion.

† The boy in this family employed by Mr. "H." as milk boy.



## APPENDIX No. XX.

REPORT OF A SERIES OF CASES OF SMALL-POX WHICH  
OCCURRED AMONGST THE BRITISH TROOPS IN CAIRO  
FROM JANUARY TO OCTOBER, 1885.

---

By Surgeon I. BOULGER, Medical Staff.

---

It is with a certain amount of diffidence that I venture upon this report, seeing that I have nothing original, either in etiology or treatment, to bring forward; but still I trust the cases will not be without interest, in that they occurred amongst a body of men so well protected as soldiers are from the attacks of this most serious disease.

In all the cases the marks of vaccination and re-vaccination have been carefully noted, and in most the medical history sheets were available to show when the re-vaccination took place, with its results.

Now it will not be amiss to say a few words about the locality where the epidemic occurred, viz., Cairo.

Cairo, this well-known and historic city, has also had an unenviable notoriety as regards various contagious diseases, pre-eminent amongst them being the plague; and there is not the slightest doubt but that all zymotic diseases must have found a congenial home in its filthy streets and amongst its swarming multitudes.

Though much has been done of late years to render the city more salubrious by cleansing the streets, affording a purer water supply, and allowing freer circulation of air by levelling mounds on the outskirts of the city, still its sanitary condition at the present day is anything but satisfactory.

The greater part of the city is undrained, and this, taken in connexion with the filthy habits of an Eastern population, will go far to explain why zymotic diseases should be endemic in their midst and should at times break out in an epidemic form.

With respect to the disease under consideration, the only safeguard against its ravages, viz., vaccination, is but indifferently, if at all, carried out, and there is a large mortality therefrom in consequence.

Again, in the poorer quarters of the city where as a matter of course the disease is most prevalent, the isolation of persons so diseased is not attended to, and those who have passed through its perils, in addition to the persons they may have infected during its acute stages, most probably wander into the streets and bazaars during convalescence, while desquamation is still going on, and thus tend to infect a wider area, one in many cases far distant from the home of those thus spreading the disease.

It is a well-known fact that even amongst fairly educated people recovering from this disease it is often very hard to convince them of the absolute necessity for their prolonged isolation until all desquamation is over, seeing that they feel in all respects restored to health, in many cases a week or more before this process is completed. How much less likely then is it that such a precaution will be adopted where the simplest rules of hygiene are ignored, if they are even known, and by a people amongst whose tenets fatalism holds a prominent place.

In this way, then, and through those persons convalescing from the disease, was the infection in my opinion conveyed to our soldiers, and was not due to any proximity to an infected area, or to any insanitary condition of the different barracks and their immediate neighbourhood.

The number of cases of the disease that occurred amongst the troops was 50; and these came from three different barracks widely separated from each other, viz. :—

1. The Citadel Barracks.
2. The Abdin Barracks.
3. The Kasr-el-Nil Barracks.

The citadel is the highest inhabited spot in and about Cairo, lies to the north, and has always been considered the healthiest part of the city.

Even in the time of the plague cases of this disease were very rare in this quarter, although there is a poor, and consequently dirty, part of the city not far from the foot of the hill on which it is built.

During the greater part of the time covered by this report, the following regiments occupied the barracks on this site, viz. :—

1. The 2nd Durham Light Infantry.
2. The 2nd Oxford Light Infantry.
3. A battery of garrison artillery.

About 1,800 men in all, including staff and departments.

The Abdin barracks are situated on the flat of the city, facing the Abdin palace, a parade ground intervening, and lie about a mile south-west of the citadel. A comparatively clean part of the city adjoins the barracks on the rear. During the early part of 1885 only staff and departments, such as mounted police and men detached from their regiments as clerks in government offices occupied these barracks, but on the arrival of the 2nd Duke of Cornwall's Light Infantry at Kasr-el-Nil, a half battalion of the 2nd Royal Sussex regiment moved into them, the other half battalion going to Suez.

The Kasr-el-Nil barracks, the third barracks occupied by British troops, lie on the west bank of the Nile, about a mile to the S.W. of Abdin barracks, and at first were occupied by the 2nd Berkshire Regiment, then by the Sussex Regiment, and latterly by the Duke of Cornwall's Light Infantry. Men belonging to the transport and commissariat staffs also occupied these barracks, the commissariat stores being within the barrack enclosure.

The barracks in this locality were some distance from any native dwellings, but a large number of Arabs and Egyptians were employed in the stores and on a branch railway which had its terminus in the barrack square and was used for bringing supplies from the main line. These workmen lived in various parts of the city. The north side of the barracks was close to the Kasr-el-Nil bridge over the Nile, and a road leading thereto from Cairo passed quite close to the windows of the men's rooms, and was a great thoroughfare for natives. The number of troops quartered in this barracks varied a great deal, as the Nile Reserve Depot had its headquarters there, and all drafts stopped a longer or shorter time before proceeding to their respective regiments up Nile. The average strength was about 900, and this, with an average strength at the citadel of 1,800 and at Abdin of 300, would bring the average strength of the whole garrison to 3,000, which was probably very near the mark during the time covered by this report.

After these preliminary observations, an account of the cases will now be given; in each case the state of vaccination as shown by the cicatrices on the arms being noticed.

1. Private G. S—, 1st Berkshire Regiment, age 22. Service, 2 years. Marks, one: left arm (good). No record of re-vaccination. Admitted 20th November 1884. Discharged 8th January 1885. 50 days. Case of average severity; initial symptoms well marked; eruption copious; discrete; went on to formation of pustules; slight secondary fever; desquamation tedious; no pitting.

2. Private A. W—, 2nd East Surrey Regiment, age 23. Service, 3 years. Marks, three: right (good). Re-vaccinated on enlistment. Modified. Admitted 4th December 1884. Discharged 8th January 1885. 36 days. This was a mild case; symptoms preceding eruption were well marked, such as lumbar pain, vomiting, pyrexia; but the eruption was scanty; discrete throughout; slight secondary fever; no pitting.

3. Boy K—, son of canteen steward, Cameron Highlanders. Marks, two: left, one; right (good). Infancy. Admitted 6th December 1884. Discharged 29th December 1884; 24 days. Very slight case; not much eruption, and very few of the vesicles matured.

4. Private T. B——, Medical Staff Corps, age 25. Service, 2 years. Marks, three: left (faint). Infancy. Never re-vaccinated. Admitted 19th December 1884. Discharged 10th February 1885. 54 days. Had previously suffered from an attack of enteric fever, for which he was admitted on 14th October 1884. Was looking after small-pox patients when he was seized.

This was a very severe attack of variola; confluent and complicated with eye mischief; severe double conjunctivitis followed by ulcers on right cornea; skin much pitted.

5. Private G. R——, 1st Royal Highlanders, age 21. Service, 1 year. Marks, two: right (faint). Re-vaccinated on enlistment. Failed. Admitted 18th January 1885. Died 21st January 1885. 8 days. This was a confluent case; there were very severe constitutional symptoms preceding eruption; high fever, which did not abate much when eruption appeared. As maturation set in, the secondary fever became very severe, and was associated with extensive congestion of lungs; maturation was rapid. On the seventh day great nervous depression supervened with delirium, and patient gradually sank and died on the morning of the eighth day of the disease.

6. Private F. A——, 2nd East Surrey, age 23. Service, 3½ years. Marks, one: right (good), three left (fair). Re-vaccinated on enlistment. Modified. Admitted 2nd February 1885. Discharged 15th May 1885. 103 days. Patient had been under treatment in hospital for a month with secondary syphilis, when symptoms of small-pox appeared. The attack was most severe, of the confluent type. Convalescence was delayed by large boils on legs, and for a long time he was in a very anæmic state. Skin much pitted.

7. Private J. K——, 2nd East Surrey, age 28. Service, 5½ years. Marks, two: right (good), one left (faint). Re-vaccinated on enlistment. Modified. Admitted 2nd February 1885. Discharged 22nd March 1885. 49 days. Was of the confluent variety; temperature before eruption appeared 103° Fahr. Patient very robust; there was a large quantity of eruption, and it went on to maturation though without much secondary fever. No complications; throat was sore.

8. Sapper J. H——, Royal Engineers, age 25. Service, 3 years. Marks, two: right (good). Re-vaccinated on enlistment. Modified. Admitted 2nd February 1885. Discharged 22nd February 1885. 21 days. Very mild; discrete; eruption scanty, but went on to maturation; no complications; no pitting; desquamation rapidly completed.

9. 1st class Staff-Sergeant E. F——, Medical Staff Corps, age 32. Service, 14 years. Marks, two: left (good), two: right (fair). Re-vaccinated 18th August 1870. Failed. Re-vaccinated 2nd March 1876. Perfect. Admitted 2nd February 1885. Discharged 21st February 1885. 19 days. Very mild case. Very little eruption, and it never went beyond the vesicular stage; had most severe initial symptoms; the lumbar pain was intense, and 24 hours before eruption appeared, he had a well-marked attack of dry pleurisy on the left side; the friction sound was very marked, and the temperature 103° Fahr.

10. Private W. B——, Medical Staff Corps, age 28. Service, 11 years. Marks, three: right and three: left (good). Re-vaccinated 18th September 1874. Failed. Admitted 6th February 1885. Discharged 22nd February 1885. 17 days. Was doing duty in the small-pox tents when he was seized. Had suffered from small-pox before, and bore marks of the same on his forehead and face. This proved an extremely mild attack; very little eruption, and it never went beyond the vesicular stage. Vesicles dried up rapidly, and he was quite well in 17 days, and resumed duty in the small-pox tents.

11. Drummer McD——, 1st South Staffordshire, age 17. Service, 3 years. Marks, two: left (good). No record of re-vaccination. Admitted 21st February 1885. Discharged 7th March 1885. 15 days. A very mild case. Very scanty eruption, but it went on to maturation rapidly; no secondary fever of any moment; desquamation rapid.

12. Private F——, 2nd Royal Sussex, age 22. Service, 3 years. Marks, two: right and two: left (faint). Re-vaccinated 2nd February 1882. Perfect. Admitted 22nd February 1885. Discharged 13th March 1885. 82 days. Very severe; initial symptoms; vomiting; lumbar pain; pyrexia very marked; eruption preceded by a scarlatinous prodromal rash over pubes and at flexures

of joints. Eruption copious, confluent on face and forehead; went on to suppuration, but there was not much secondary fever. Large, soft crusts formed on face when the pustules ruptured, and convalescence was long delayed owing to the adherence of these crusts.

13. Sergeant C—, Commissariat and Transport Corps, age 37. Service, 14 years. Marks, four: right (good). Never re-vaccinated. Admitted 24th February 1885. Discharged 20th April 1885. 56 days. Was in hospital under treatment for fistula in ano in one of my wards when he was seized. Had been a patient for three weeks.

The attack was of average severity; eruption plentiful, but discrete everywhere. The eruption went on to suppuration.

14. Lance-Corporal H—, 2nd Royal Sussex, age 24. Service, 4 years. Marks, three: left (good). Re-vaccinated 28th May 1880. Failed. Admitted 2nd March 1885. Discharged 26th March 1885. 25 days. Very mild case throughout. Scanty eruption, which only became pustular in a few places; desquamation very rapid.

15. Private H—, 2nd Royal Sussex, age 21. Service, 3 years. Marks, two: left (good). Re-vaccinated 26th April 1882. Failed. Admitted 11th March 1885. Discharged 8th April 1885. 29 days. Very mild case. Eruption scanty, and pursued the same course as in No. 14.

16. Private W—, 2nd Royal Sussex, age 22. Service, 3½ years. Marks, three: left (good). Re-vaccinated 7th October. Failed. Admitted 13th March 1885. Discharged 8th April 1885. 27 days. Very mild case. Very similar to cases 14 and 15.

17. Private T—, 2nd Royal Sussex, age 22. Service, 2 years. Marks, four: left (good). Re-vaccinated 17th May 1883. Failed. Admitted 14th March 1885. Discharged 8th April 1885. 26 days. Very mild. Very like cases 14, 15, and 16.

18. Private N—, 2nd Royal Sussex, age 19. Service, 1 year. Marks, four: left (good). Re-vaccinated 26th June 1884. Failed. Admitted 16th March 1885. Discharged 16th April 1885. 32 days. Case of average severity; eruption plentiful, but discrete; constitutional symptoms severe before eruption; no secondary fever of any moment; eruption went on to suppuration; desquamation rapid.

19. Private P—, 2nd Royal Sussex, age 21. Service, 2 years. Marks, two: left (fair). Re-vaccinated 24th May 1883. Modified. Admitted 21st March 1885. Discharged 4th May 1885. 45 days. Severe case; eruption confluent with marked nervous symptoms; eruption went on to pustulation; secondary fever high; extensive crusts formed on face; desquamation was long delayed; slight pitting.

20. Private B—, 2nd Royal Sussex, age 20. Service, 6 years. Marks, two: left (faint). Re-vaccinated October 1883. Result not known. Admitted 21st March 1885. Discharged 13th May 1885. 55 days. Severe case; confluent variety and complicated with severe conjunctivitis; eruption went on to pustulation and formation of large crusts, which were slow to separate; desquamation very tedious.

21. Private C—, 2nd Royal Sussex, age 23. Service, 4½ years. Marks, two: left (good). Re-vaccinated 2nd December 1881. Modified. Admitted 24th March 1885. Discharged 2nd May 1885. 40 days. Case of average severity; semi-confluent; eruption plentiful and went on to pustulation; no complications; desquamation slow.

22. Lance-Corporal S—, 2nd Royal Sussex, age 23. Service, 3½ years. Marks, two: right (good), four: left (fair). Re-vaccinated 1881. Modified. Admitted 25th March 1885. Discharged 21st April 1885. 28 days. Very mild case; eruption scanty; no secondary fever of any consequence; pustules formed and soon dried up; desquamation rapid.

23. Private N—, 2nd Oxford Light Infantry, age 20. Service, 1½ years. Marks, three: left (good). Re-vaccinated 22nd November 1883. Failed. Admitted 27th March 1885. Discharged 4th May 1885. 39 days. This man was admitted into hospital on the 25th March 1885 suffering from gonorrhœa. On the 27th he showed symptoms of small-pox, and he was removed to a tent. There was slight lumbar pain for two days before eruption, and he complained of this shortly after admission.

Very mild case; eruption scanty, and principally on face and forehead, there being only a few papules on chest and arms; only a few of the papules became vesicular; desquamation slight.

24. Private R—, 2nd Royal Sussex, age 23. Service, 3 years. Marks, one: left (faint). Re-vaccinated on enlistment. No record of result. Admitted 24th March 1885. Discharged 8th August 1885. 42 days. Severe case. Eruption plentiful, but discrete; eruption went on to suppuration; sharp secondary fever; desquamation tedious; no pitting.

25. Private F—, 2nd Royal Sussex, age 23. Service, 4 years. Marks, two: left (faint). Re-vaccinated on enlistment. No record of result. Admitted 30th March 1885. Discharged 6th May 1885. 38 days. Severe case; confluent; went on to suppuration; secondary fever well marked; slight congestion of lungs.

26. Private P—, 1st Royal Sussex, age 21. Service, 3½ years. Marks, two: left (faint). Re-vaccinated on enlistment. Failed. Admitted 7th April 1885. Died 10th April 1885. Four days. Felt ill first on the 4th April, suffering from general muscular pains, especially in his back and forehead. On the 6th he vomited several times, and on the 7th, feeling very ill, he reported himself sick and was taken into hospital. When admitted he was in a high state of fever, and there was a roseolar rash all over his body. He was isolated, and on the morning of the 8th was removed to the small-pox tent, as well marked papules had come out during the night. The papules appeared imbedded in the roseolar rash, which had now become of a purplish colour. The eruption of papules was extremely copious, and patient's condition was one of depression; pulse, 95; respiration, 20; temperature, 100° Fahr. Tongue furred brown, deeply fissured, and dry. Great uneasiness at epigastrium. Became delirious on the night of the 8th.

April 9th. Very prostrate. Tongue, lips, and teeth covered with sordes; blood exuding from tongue fissures. Passed four stools since yesterday, the last two streaked with blood. Pulse, small, 98; respiration, 22; temperature, 102·2° at 10 a.m. Papules more distinct. Face has assumed a very dusky, purplish hue, and there are numerous petechiæ about chest, back, and loins. Remained much the same during the day. Temperature, 105° at 6 p.m.

April 10th. Violently delirious during last night. This morning is in a semi-comatose state; lips covered with bloody sordes. Pulse weak, 100; respiration, 30; temperature, 103·6° (10 a.m.). Extensive hæmorrhage into subcutaneous connective tissue of face, chest, and abdomen; conjunctivæ ecchymosed; slight bleeding from nose and from fissures about wrists. Very offensive odour from body; breath fætid. Taken nourishment freely throughout. Large quantities of stimulants given. Sank gradually, and died comatose at 10 p.m.

27. Private H—, 2nd Royal Sussex, age 22. Service, 3½ years. Marks, four: left (good). Re-vaccinated 10th June 1881. Failed. Admitted 14th April 1885. Discharged 2nd June 1885. 50 days. Case of average severity. Eruption plentiful but discrete. Secondary fever slight; reached 100·6° on the evening of the 17th; maturation rapid; was completed on the sixth day, when temperature became normal. There was considerable delay in desquamation.

28. Private M—, 1st Yorkshire Regiment, age 20. Service, 2 years. Marks, three: right (good). Re-vaccinated on enlistment. Modified. Admitted 16th April 1885. Discharged 16th May 1885. 31 days. Case of average severity; eruption copious but discrete; went on to suppuration; no complications, except severe sore throat.

29. Private B—, 2nd Royal Sussex, age 21. Service, 1 year. Marks, one: right (faint). Re-vaccinated 25th August 1884. Failed. Admitted 25th April 1885. Discharged 27th May 1885. 33 days. Very severe case; lumbar pain; vomiting and pyrexia very marked before eruption. Papules appeared on forehead on 27th, and next day a few on face and trunk. There was great nervous depression, evidenced by tremors. On 28th there was not much progress as regards eruption, but numerous petechiæ made their appearance, especially about the groins. The throat and conjunctivæ were inflamed, and depression was very great.

On the 29th he was very drowsy, and there was considerable extravasation of blood into skin over various parts; tongue much swollen, dry and brown; and

on the left side of its dorsum there was a circumscribed blood tumour the size of a small nut. Pulse, small; temperature,  $103^{\circ}$ ; slight bronchial symptoms. By the use of large quantities of stimulants, together with tincture of Ferri Perchlor and quinine and an expectorant mixture, the symptoms gradually improved.

On the 1st May there was hardly any eruption visible, only a few papules on forehead and wrists, with here and there a vesicle, but no pustule in any quarter. By the 7th May all extravasation had disappeared from skin and tongue. Made an excellent and rapid convalescence.

30. 2nd Corporal T—, Royal Engineers, age 25. Service, 7 years. Marks, two: left (one good). Never re-vaccinated. Admitted 25th April 1885. Discharged 14th June 1885. 51 days. Severe case; confluent; rapid maturation, with considerable secondary fever; marked delirium; double conjunctivitis; sore throat and diarrhœa. Was suffering, too, from inflamed external piles. Eruption dried up rapidly, but eye symptoms continued, and ultimately ulceration of left cornea took place, which proved very troublesome. Later, convalescence was retarded by large boils on neck and anterior surface of right thigh.

31. Private C—, Medical Staff Corps, age 22. Service, 4 years. Marks, two: left (good). Re-vaccinated 31st December 1880 and 17th January 1883. Failed. Admitted 27th April 1885. Discharged 6th May 1885. 10 days. Extremely mild case; in fact, might fairly be styled an abortive attack. On 27th complained of severe pain in back, headache; temperature,  $102^{\circ}$ ; no vomiting. On 30th there was a scanty eruption of shotty papules on forehead and a few on face and neck; none on trunk. On May 4th these papules had dried up without the production of a single vesicle. On the 6th was quite well, and was discharged to do duty in the small-pox tents.

32. Private O—, 2nd Royal Sussex, age 20. Service, 2 years. Marks, three: left (good). Re-vaccinated 25th August 1883. Modified. Admitted 29th April 1885. Discharged 5th June 1885. 38 days. Case of average severity; initial symptoms severe. Eruption copious, but discrete; went on to pustulation; not much secondary fever. No complications or pitting. Desquamation tedious.

33. Private M—, 2nd Royal Sussex, age 20. Service,  $1\frac{1}{2}$  years. Marks, one: left (good). Re-vaccinated 19th June 1884. Failed. Admitted 2nd May 1885. Discharged 17th June 1885. 47 days. Another abortive case as regards eruption; only a few papules appeared on forehead and face; the initial symptoms were well marked. The papules dried up without bearing vesicles. On the 26th May, while still under treatment, as desquamation was not completed, he complained of pain in his chest and difficulty in breathing; the temperature, which had been normal for some time, was found to be  $103^{\circ}$ . On auscultation congestion of bases of lungs was discovered and in a day or two rather suspicious-looking diarrhœa set in. The stools were pea-soupy in colour and consistence, and there was slight gurgling in the right iliac fossa, but no pain or tenderness. The temperature kept steadily above the normal, ranging from  $101^{\circ}$  to  $103^{\circ}$ , but it was not at all typical of enteric fever. There were no rose spots anywhere. The diarrhœa continued till the 11th June, when the stools became firmer and darker; lung symptoms had cleared up a day or two previously. Remained anæmic for some time.

34. Private C—, 2nd Oxford Light Infantry, age 20. Service,  $1\frac{1}{2}$  years. Marks, two: right, two left (good). Re-vaccinated 23rd October 1883. Failed. Admitted 5th May 1885. Discharged 16th June 1885. 43 days. Severe case; very pronounced initial symptoms. Temperature rose to  $104^{\circ}4'$  before eruption appeared. Eruption came out on 7th, and was very copious, confluent all over body; sore throat very marked. Eruption passed on to vesicles and pustules, rapidly accompanied by delirium and secondary fever and great swelling of the face and hands. Pustules began to burst on 17th, and large moist crusts formed, which were very slow in falling off. Some pitting.

35. Private C—, 2nd Royal Sussex, age 23. Service,  $3\frac{1}{2}$  years. Marks, four: left (good). Re-vaccinated 23rd November 1881. Failed. Admitted 5th May 1885. Discharged 14th June 1885. 41 days. Very mild case. Initial symptoms severe. Temperature,  $103^{\circ}2'$ . Papules began to come out on the 6th, principally on forehead and face, very few on trunk or limbs. Very few

of the papules became vesicles, and those that did so dried up on the 12th without maturing. Desquamation long continued.

36. Veterinary-Surgeon D—, Army Veterinary Department, age 24. Service,  $\frac{1}{2}$  year. Marks, one: left (good). Never re-vaccinated. Admitted 5th May 1885. Discharged 28th May 1885. 21 days. Very mild case. Initial symptoms of medium severity. Nausea, but no vomiting. Only scanty eruption of papules, some of which only went on to pustulation. No complications. Desquamation rapid.

37. Private A—, 2nd Royal Sussex, age 20. Service, 2 years. Marks, three: right (good). Re-vaccinated 25th May 1883. Perfect. Admitted 11th May 1885. Discharged 22nd June 1885. 43 days. Case of average severity. Eruption copious, but discrete; went on to formation of pustules. Very little secondary fever. No complications. Desquamation much prolonged.

38. Private G—, 1st South Stafford, age 18. Service,  $4\frac{1}{2}$  years. Marks, five: left (good). Re-vaccinated 11th November 1880. Failed. Admitted 19th May 1885. Discharged 23rd June 1885. 36 days. Exceedingly mild case. Initial symptoms well marked. Temperature rose to  $104^{\circ}$  before eruption appeared. Eruption very scanty and only on forehead and face. Only a few vesicles formed, and these rapidly dried up. No complications or secondary fever.

39. Private McF—, 1st Gordon Highlanders, age 26. Service,  $5\frac{1}{2}$  years. Marks, three: left (very faint). Re-vaccinated 10th October 1879. Modified. Admitted 20th May 1885. Died 28th May 1885. 9 days. This man was admitted to hospital on the 28th April 1885. Suffering from secondary syphilis. On the 18th May while still in hospital he was seized with lumber pain, headache, and vomiting. Temperature  $104^{\circ}2'$  on 20th. On the morning of the 21st there was a copious eruption of shotty papules on his forehead, and he was removed to the small-pox enclosure. Fever and irritability of stomach still continued.

May 22nd. Vomiting continues in spite of treatment (acid Hydro-Cyan. dil. and ice to suck), but got better towards evening. Papules on forehead enlarging, and there are others coming out on face, neck, and arms.

May 23rd. Eruption all over body. Rapidly becoming vesicular on forehead and face, where it is confluent. Temperature  $100^{\circ}$ ; pulse 100. Tongue thickly coated. Bowels regular. No vomiting.

May 24th. Delirious last night. Eruption rapidly becoming pustular. Is confluent more or less everywhere. Pulse very weak and soft. Conjunctivæ injected. Throat sore; takes nourishment freely. Quite conscious. Is taking stimulants, both alcoholic and medicinal. Secondary fever moderate; not higher than  $102^{\circ}$  in the evening.

May 25th. Strength keeping up. Pustules somewhat flattened on forehead and face. Slept fairly last night. No delirium.

May 26th. Remains in much the same condition.

May 27th. Breathing has become difficult. No cough. Congestion of both bases of lungs discovered. Tongue dry with some sordes about the teeth. No delirium and slept fairly last night. Temperature  $101^{\circ}$  (10 a.m.). Pustules have broken on forehead and face and form a mask over the features. Considerable swelling of face. There is also a sanious discharge from nostrils. Throat still sore, but he takes his nourishment without much difficulty.

May 28th. Passed a restless night but no delirium. Is much weaker this morning and symptoms of marked asthenia are showing. Got rapidly worse at 2.30 p.m., breathing got very difficult, and he soon became unconscious and died at 4.30 p.m.

40. Sergeant L—, 2nd Royal Sussex, age 22. Service, 4 years. Marks, one: left (good). Re-vaccinated 27th May 1881. Failed. Admitted 26th May 1885. Discharged 22nd June 1885. 28 days. Mild case. Initial symptoms well marked. The temperature went up to  $104^{\circ}2'$  just before eruption appeared. Eruption in form of shotty papules on forehead and face appeared on 28th. Temperature then became normal. Papules rapidly became vesicular. No eruption except on forehead, face and arms. Discrete everywhere. Some of the vesicles went on to pustulation, but the majority rapidly dried up. No secondary fever. Suffered from slight sore throat. Convalescence rapid.

41. Bombadier D—, Royal Artillery, age 21. Service, 3 years. Marks, two : left (good). Never re-vaccinated. Admitted 8th June 1885. Discharged 6th July 1885. 30 days. Case of average severity. Temperature rose to  $101^{\circ}$  before eruption appeared on 9th. Eruption copious on forehead and face (semi-confluent), but very little formed on body and limbs. Papules rapidly developed into vesicles. Only slight secondary fever at maturation, which was at its height on 13th. The only complication was slight double conjunctivitis. Large crusts formed on face, but desquamation was not much prolonged thereby.

42. Private B—, 2nd Royal Sussex, age 25. Service, 3 years. Marks, two : left (good). Never re-vaccinated. Admitted 15th June 1885. Discharged 14th July 1885. 30 days. Case of average severity. Vomiting and lumbar pain well marked at onset. There was copious eruption, discrete for the most part, but went on to the formation of pustules. Very little secondary fever, but heart's action became very weak on 6th day with tremulousness of upper extremities. Under the use of stimulants these untoward symptoms disappeared and patient made a good convalescence.

43. Lieutenant O'G—, 2nd Royal Sussex, age 25. Service, 4 years. Marks, two : left (good), from infancy. Never re-vaccinated. Admitted 17th June 1885. Discharged 8th July 1885. 22 days. This was a case in which the length of incubation was ascertained without doubt, and it was 12 days. The officer in question had been doing duty up Nile and only returned to Cairo on the 2nd June, taking up his quarters in the Abdin barracks, from which locality so many cases had come. On the 14th he began to feel out of sorts; was feverish; had muscular pains all over body, which the next day were concentrated in the lumbar region. He also suffered from nausea and vomited once or twice. Was treated by the medical officer in charge of the staff, who, when the eruption appeared, transferred him to the citadel hospital, where he was placed in an E. P. tent. Case proved a very mild one. Very scanty eruption and only a few vesicles went on to formation of pustules. No secondary fever.

44. Private J—, 2nd Duke of Cornwall's Light Infantry, age 24. Service, 4 years. Marks, two : left (good). Re-vaccinated on enlistment. Modified. Admitted 24th June 1885. Discharged 21st July 1885. 25 days. Very mild case; but the eruption went on to pustulation. Eruption scanty and discrete everywhere. No secondary fever. Desquamation rapid.

45. Private S—, 1st Royal West Kent, age 22. Service, 3 years. Marks, three : left (good). Re-vaccinated 1882. Modified. Admitted 27th June 1885. Discharged 12th August 1885. 47 days. This case was somewhat peculiar in that the patient was admitted to hospital on the 12th June, suffering from muscular pains all over his body. These pains continued more or less severe till the 24th June when his temperature rose to  $102^{\circ}$ , the pain at the same time becoming aggravated, especially in the lumbar region. There was also vomiting. Temperature  $103^{\circ}$  (6 p.m.).

June 25th. Morning temperature,  $103^{\circ}$ ; evening,  $103.6^{\circ}$ . Pains less severe; but vomiting continues at intervals.

June 26th. Morning temperature  $104.2^{\circ}$ . Vomiting and pains ceased, but there is flushing of the face with headache. A few suspicious looking papules on neck and a few on the right side of face near the ear. Forehead quite smooth. Evening temperature  $104^{\circ}$  F.

June 27th. This morning temperature is,  $102.2^{\circ}$ , and there is a well-marked, shotty papular eruption all over forehead. The temperature fell to normal very soon, and though there was a copious discrete eruption all over body, which went on to pustulation rapidly, still there were no constitutional symptoms of any moment and only slight secondary fever on the 30th June, when the pustules were at their height. Desquamation proved tedious, however.

46. Schoolmaster R—, 2nd Duke of Cornwall's Light Infantry, age 31. Service, 10 years. Marks, three : left (good). Never re-vaccinated. Admitted 29th June 1885. Discharged 28th July 1885. 30 days. This was another case showing unusual initial symptoms. Patient was admitted on 29th June, complaining of sore throat and general weakness. The voice was weak and husky and there was marked congestion of both tonsils and back of pharynx. Said he had been feeling out of sorts for some days. There was no rise in temperature; tongue with whitish fur; bowels constipated. Ordered alum



gargle and mistura Quinæ, grs. v. t. d. The next day (30th) he was much the same, and on the evening of this day his temperature was  $99^{\circ}2^{\circ}$ .

July 1st. Remains much the same, but complains of pains in his chest, especially beneath right clavicle, where the breath sounds were rather weak and harsh. Throat continued congested, pulse 90, temperature normal; respirations normal; no cough. Ordered a chlorate of potash mixture with tincture of cinchona and spirits of chloroform. Throat swabbed with solution of nitrate of silver. Skin beneath clavicle painted with liniment of iodine.

July 2nd. Became much worse yesterday evening, vomited several times, and temperature rose to  $104^{\circ}$ , but this morning is down to  $101^{\circ}$ . Bowels are now acting. Tongue only slightly coated. He attributed the vomiting to the application made to his throat, which was repeated on the evening of the 1st, and after which he began to vomit. The temperature on the evening of the 2nd was  $101^{\circ}4$ ; vomiting has ceased.

July 3rd. Much the same temperature  $99^{\circ}$  (10 a.m.),  $99^{\circ}4^{\circ}$  (6 p.m.).

July 4th. Says he feels better; there is less congestion of throat. Temperature  $98^{\circ}$  (10 a.m.),  $99^{\circ}$  (6 p.m.).

July 5th. This morning, the seventh of his stay in hospital, the temperature was  $98^{\circ}2^{\circ}$ , but there was a suspicious-looking papular eruption on various parts of the body.

July 6th. Was removed to small-pox enclosure, as papules are now coming out freely on forehead and face.

July 7th. Copious eruption of papules; discrete everywhere; temperature normal.

Eruption went on rapidly to maturation and was drying up satisfactorily on the 15th. Desquamation rapid.

47. Private F—, 2nd Oxford Light Infantry, age 20. Service, 2 years. Marks, two: left (good). Re-vaccinated July 1883. Perfect. Admitted 15th July 1885. Discharged 12th August 1885. 29 days. Mild case; usual initial symptoms, and which were well marked. Eruption appeared on 17th, was scanty and principally on forehead and face; discrete everywhere.

Papular became vesicular on 19th and then proceeded no farther, but rapidly desiccated. No secondary fever. Case was complicated with slight sore throat. Desquamation rapid.

48. Lance-Corporal G—, Mounted Police, age 26. Service, 6 years. Marks, four: left (faint). Re-vaccinated 25th September 1879. Modified. Admitted 30th July 1885. Died 3rd August 1885. 5 days. Was admitted with feverish symptoms on 30th July, and was transferred to small-pox tent the same evening by the orderly medical officer.

August 1st. I saw him for the first time at 10 a.m. this day. He was then suffering from slight epistaxis, which he stated began at 9 a.m. yesterday, and had continued at intervals. Ever since there were numerous small flattened papules on forehead and much larger ones on his wrists and backs of hands. There was a scanty flattened papular eruption in patches on his trunk and legs, and this was of a dusky red colour; the tongue was blackened from the blood he had swallowed. Temperature,  $101^{\circ}$ . Pulse 100, of fair volume. Ice was applied over nose and nostrils syringed with alum solution 6.30 p.m. Both nostrils were plugged 9 p.m. Passed a large quantity of coagulated blood per anum. Epistaxis now in abeyance. The eruption shows no signs of developing; some of the papules have receded on the forehead, and there are none on the face; those on the limbs have become confluent and flattened, and markedly so on the wrists and dorsum of hands. The trunk eruption still patchy, ill-defined, hæmorrhagic, and there are well-marked petechiæ about the groins.

August 2nd. Slept a little during the night; no return of epistaxis or melæna. No improvement, however, in character of eruption; moreover, the eruption on legs has become hæmorrhagic. Temperature,  $102^{\circ}2^{\circ}$ . Pulse 120, small. Takes nourishment freely.

August 3rd. Some sleep during the night. Is no better. Has become very restless. Eruption has receded from forehead, a few petechiæ taking its place. Eruption on limbs black. Became rapidly worse at 10.30 a.m., breathing got very hurried, and pulse feeble, almost to extinction. Suddenly collapse set in,

and he died at 10.45 a.m., having been conscious to within a few minutes of his death.

49. Private W—, 2nd Duke of Cornwall's Light Infantry, age 21. Service  $1\frac{5}{8}$  years. Marks, two: left (faint). Re-vaccinated 15th March 1884. Failed. Admitted 27th August 1885. Discharged 3rd October 1885. 38 days. Severe case; marked initial symptoms. Temperature  $102^{\circ}$ . Great nausea, but no vomiting. Slight petechial rash over both groins preceding eruption.

Eruption copious on face and forehead, and the temperature did not fall on the eruption appearing on the 28th, stood at  $102\cdot4$ ; pulse, 108.

The trunk and limbs were invaded next day. Temperature  $101\cdot80^{\circ}$ ; pulse 96. Slight diarrhoea; stools foetid; slight sore throat.

On the 5th day the eruption vesicles had formed, discrete on trunk and limbs, but cohering on face and forehead. Pustules were fully formed two days later, but the temperature, which had fallen to normal the day before, only rose to  $99\cdot5$  as maturation set in.

Was delirious on 7th night. The next day the temperature had risen to  $101\cdot2^{\circ}$ ; pulse 120. From this date he began to mend rapidly, and on the 10th day the temperature was normal, and eruption drying up.

Large crusts formed on forehead, face, and hands. When these separated the skin was left red and painful, which was soothed by vaseline. Desquamation somewhat tedious.

50. Private B—, 1st Black Watch, age 23. Service, 2 years. Marks, two: left (good). Never re-vaccinated. Admitted 5th October 1885. Discharged 10th November 1885. 37 days. Case of average severity. Eruption copious. Confluent on face and forehead; no secondary fever. Eruption went on to pustulation; severe sore throat, as he had a large crop of pustules on soft and hard palates and back of pharynx. Convalesced satisfactorily; no pitting.

*Remarks.*—In the first place, as to the per-centage of attacks to strength of garrison. It has already been mentioned that the average strength of the Cairo garrison during the time this report covers was 3,000 non-commissioned officers and men. The troops, which were quartered at Abbasiyeh, are not included in this strength, as the cases of small-pox which occurred amongst this body of men, and they were but few, were treated in the station hospital at that place, and so did not come under my supervision.

The fluctuation of the Cairo garrison was owing to the frequent arrival of drafts from home, and movement of detachments up Nile.

This strength, therefore, with 48 cases of the disease amongst the non-commissioned officers and men, would give a per-centage of 1.6 attacks to strength.

The average strength of officers during the same period was 120, and this with two cases of the disease would give a per-centage of 1.66, or a rather higher ratio than amongst the men.

As will be seen from the detailed account of the cases, there were four deaths, and this gives a mortality of 8 per cent. in those attacked, and a total mortality to strength of 0.26.

Now a few words as to the management of the cases. They were treated in tents throughout (hospital marquees). The tents were pitched within the citadel hospital enclosure, and were about 50 yards from the basement of the Right Division.

Practically, the patients were in the open air, for the sides of the tents were tied up, so that there was almost perfect ventilation.

During the middle of the summer the heat in the tents was somewhat trying for a few hours during the day, but the greatest discomfort arose when a dust storm was blowing. Rain seldom occurred during the season, and as regards heat, it was a matter of general remark amongst the inhabitants, that the summer this year was milder than it had been for many years.

As to treatment, no routine plan was followed. Symptoms were treated as they arose, and for the greater number of the patients hardly any medicine was required, except an occasional purge and quinine and iron during convalescence.

During desquamation, warm bathing with inunction of carbolic oil was practised with success.

Stimulants, both medicinal and alcoholic, were freely given in cases showing signs of nervous depression with delirium, and a few cases required hypnotics, such as bromide of potassium and chloral, for insomnia.

As to complications, there were very few considering the number of cases, and if the fatal cases be excluded, hardly any.

Sore throat was troublesome in a few of the cases, but this must be looked upon rather as part of the original disease, than as a complication. Moreover, it only occurred in those cases where the eruption was very abundant; but even in several of these the throat was but slightly affected with pustules.

Eye complications occurred in three cases, viz., in cases Nos. 4, 20, and 30. Injection of the conjunctivæ occurred in a great many cases, but only in those noted did the eye mischief last more than a few days. In cases 4 and 30 ulceration of cornea occurred, which delayed convalescence materially.

Boils occurred in a few of the cases, notably in cases Nos. 6 and 30, and proved tedious.

Prodromal rashes occurred in a few of the cases, viz., Nos. 12, 26, 49, and in each case the disease proved severe, No. 26 proving fatal. The rash in No. 12 was of a scarlatinous character, and occurred over the pubes and flexures of the joints. In No. 26 the rash was of a roseolous type and was diffused all over the body 24 hours before papules appeared.

In No. 49 petechiæ appeared over both groins before papules came out on forehead and face.

In several cases petechiæ made their appearance during the course of the disease, viz., in two of the fatal cases, and in No. 29. This last-mentioned case had also, later on, extravasation of blood in much larger patches over the trunk, and a circumscribed blood tumour formed in the tongue.

Two of the fatal cases, viz., Nos. 26 and 48, were well marked examples of the hæmorrhagic variety of the disease.

Case No. 9 was peculiar, in that the eruption was preceded by a well marked attack of dry pleurisy.

Case No. 46 was peculiar, as the symptoms seem to have been present from the time of the reception of the variolous poison, that is, if the period of incubation is to be reckoned as 12 days. He was admitted on the 29th June and had then been ill for some days, but he was able to perform his duties as a schoolmaster, though with great difficulty. The eruption did not appear till the 5th July, viz., seven days after admission to hospital.

Case 33. Here there is every probability that the patient suffered from a mild attack of enteric fever while convalescing from small-pox. No spots, however, were visible, and the temperature did not run the typical course. Enteric fever was very prevalent at the time, and other cases of the disease showed the same irregularities.

It will have been seen from the notes on the cases that several of those who were attacked by small-pox were in hospital at the time under treatment for other diseases, viz., cases Nos. 6, 13, 23, and 39.

Case 23 can be disposed of in a few words. He was admitted with gonorrhœa on the 25th March, and on the 27th March well marked, shotty papules appeared on his forehead, the interval being occupied by such symptoms as lumbar pain, vomiting, &c. This man, without doubt, had the disease on admission.

Case No. 6 had been in hospital for a month, suffering from secondary syphilis, and case No. 39, which proved fatal, had been under treatment for the same disease for 20 days.

Case No. 13 had been in hospital three weeks with fistula in ano.

For case No. 6 to have had small-pox incubating on admission, an incubative period of 30 days at least, must be granted, and I have no recollection of such a lengthy period having been allotted to this stage of the malady. He may, however, have gone to the neighborhood of the small-pox enclosure; though he was being treated in a part of the hospital considerably removed therefrom.

Case No. 39, in like manner, was being treated in the basement of the centre division of the hospital, which was separated from the small-pox enclosure by a range of high buildings (part of the hospital), and to get thither he would have had to cross a small courtyard and go along two passages at right angles

to each other, the outer one of which abutted on the area on the centre of which the small-pox tents were pitched.

However, as the patient was not confined to his bed, he may have gone in this direction, though he denied having done so.

Or, may it not have been a case in which the incubation was prolonged to at least 20 days?

Case No. 23 had been in hospital three weeks, but here there was more likelihood of his having contracted the disease while in hospital, for he was being treated in an upstairs ward of the right division, and his bed was next to a window which looked out upon the small-pox enclosure, and about 50 yards away.

This patient was confined to bed, owing to the nature of his disease, and I think it very unlikely that he went downstairs, and so got nearer to the source of contagion. He, moreover, flatly denied having done so.

In this case could the incubation have been of 21 days' duration? or did the patient become infected through the open window? or did I prove the carrier of the contagion, for I was in attendance upon him as well as looking after the small-pox patients?

I am unable to speak with confidence as to the medium, but am inclined to the open window theory; though why should he have been the only one attacked in the ward?

It is not without interest to note in what proportions the cases were supplied by the several barracks occupied by the troops; and it will be seen at a glance that the bulk of those attacked were quartered in the Kasr-el-Nil Barracks.

The numbers from the respective barracks were:—

1. Kasr-el-Nil Barracks	-	-	28 cases.
2. Citadel Barracks	-	-	11 „
3. Abdin	-	-	10 „
Royal Hotel	-	-	1 case, veterinary surgeon.

This would seem to indicate some closer connexion with the contagion in the case of the Kasr-el-Nil Barracks; but, as has already been stated, this barracks was much further removed from inhabited native dwellings than the others.

The only other difference between them was the presence of the commissariat stores and the branch railway at the Kasr-el-Nil Barracks; and here, in my opinion, lies the explanation of the greater number of cases furnished from this quarter. The natives employed in these stores, and on the railway, were the carriers of the contagion, though in no single case could the disease be traced to an antecedent case, though everything was done that could be done, with this object in view.

And now a few remarks as to the marks of vaccination present in those attacked.

None of the cases were without marks of some sort, and in only a few instances was re-vaccination ascertained not to have been performed on enlistment.

All the mild cases, 21 in number, had good cicatrices, though in a few of these there was only one well-marked foveated scar; this, however, proving that the operation had been efficiently performed.

Cases of average severity, 13 in number, varied a great deal in the marks they bore; some showing well-depressed cicatrices, whereas others had only very superficial scars of a dead white colour. Amongst this class were those who had not been re-vaccinated on enlistment.

The severe cases, 12 in number, had for the most part but very indifferent marks, though some amongst them showed well depressed scars.

The fatal cases, four in number, all bore marks, but in each case they were exceedingly faint. All had been re-vaccinated on enlistment, two being failures and two modified.

In conclusion, I cannot but express an opinion that the number of cases that occurred was large considering the protected state of the body of men from which they came; and it seems to me that it would have been advisable for another attempt at re-vaccination to have been made in several of the cases which failed to take when the operation was performed on enlistment, especially in those who bore but faint marks from infancy.

In only two of the cases that came under notice was there a record of this having been done, viz., in cases Nos. 9 and 31, and both of these had an exceedingly mild attack.

More especially ought this to be practised in men of the Medical Staff Corps, whose duties may take them in close proximity to the disease at any time.

Another point I would like to refer to before closing these remarks, and it is one on which there is a great difference of opinion amongst medical men, viz., as to the length of time immunity is guaranteed by efficient vaccination.

Of course all soldiers are re-vaccinated on enlistment, or it may be, vaccinated for the first time, and the cases that escape this operation are very few indeed, though a few came under notice during this epidemic, and under the present conditions of military service this, all will allow, is ample protection.

But even now a certain number of men, especially non-commissioned officers, re-engage and may go on to serve for a pension, and the question arises whether in such cases re-vaccination should not be again performed as a matter of precaution, though they bear good marks.

---

---

APPENDIX No. XXI.

---

## APPENDIX

## Annual Abstract of Meteorological Observations taken

NETLEY.

Lat. 50° 51' N.

Month.	Mean Pressure.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.		Per Cent.		Minimum.		
			Min.	Max.	Temp.	Day.	Temp.	Day.			Mean.	Per Cent.	Day.
January -	29° 813	39° 0	31° 6	43° 9	24° 0	7th	66° 0	4th	204	88° 8	61° 0	7th	
February -	29° 644	45° 0	37° 3	50° 8	25° 0	19th	63° 0	7th	273	91° 3	64° 0	21st	
March -	30° 000	44° 0	32° 1	51° 5	25° 0	15th	65° 0	5th	225	80° 9	70° 0	25th	
April -	29° 730	49° 0	36° 8	58° 1	23° 0	5th	71° 0	19th	284	79° 2	62° 0	21st	
May -	29° 745	52° 4	40° 6	60° 7	33° 4	12th	68° 0	1st	308	77° 3	56° 0	16th	
June -	29° 973	60° 4	48° 1	71° 3	38° 0	11th	82° 0	14th	416	73° 0	38° 0	11th	
July -	30° 109	63° 0	50° 3	77° 4	41° 0	10th	95° 0	26th	463	70° 9	50° 0	29th	
August -	29° 878	61° 0	48° 4	72° 3	38° 0	6th	84° 0	17th	409	71° 0	56° 0	1st	
September -	29° 833	59° 0	47° 6	66° 3	30° 0	27th	72° 0	6th	409	82° 9	48° 9	28th	
October -	29° 657	51° 0	40° 4	55° 5	32° 3	12th	67° 8	9th	293	85° 3	71° 5	3rd	
November -	29° 843	47° 4	38° 5	50° 4	28° 2	17th	56° 2	30th	274	93° 4	61° 0	17th	
December -	30° 187	43° 0	32° 8	45° 5	20° 0	11th	51° 3	1st	213	88° 8	46° 0	9th	
Mean -	29° 868	51° 2	40° 4	58° 6	29° 8	—	70° 1	—	314	81° 9	57° 0	—	

## GIBRALTAR.

Lat. 36° 6' 20" N.

January -	30° 023	53° 0	47° 9	58° 3	36° 0	16th	70° 0	10th	344	88° 1	66° 0	12th
February -	30° 129	58° 0	52° 4	64° 0	48° 0	7th	70° 0	9th	411	88° 9	58° 8	10th
March -	29° 975	57° 0	50° 2	62° 9	43° 0	31st	70° 0	5th	384	89° 5	77° 4	26th
April -	30° 008	59° 0	50° 7	63° 2	40° 0	2nd	70° 0	23rd	387	83° 4	69° 0	23rd
May -	30° 077	68° 0	57° 7	73° 0	52° 0	1st	79° 0	24th	541	84° 5	69° 6	23rd
June -	30° 072	69° 0	61° 6	72° 9	53° 6	17th	83° 2	21st	617	87° 4	69° 5	30th
July -	30° 104	72° 0	64° 3	79° 2	58° 7	2nd	84° 2	29th	688	84° 0	70° 4	31st
August -	30° 051	73° 0	65° 0	81° 8	59° 0	31st	87° 4	19th	765	90° 0	75° 0	12th
September -	30° 104	72° 0	62° 0	75° 9	55° 0	30th	80° 0	4th	672	90° 2	79° 0	5rd
October -	30° 085	64° 0	54° 9	68° 7	45° 4	13th	76° 2	4th	463	82° 8	82° 0	11th
November -	30° 088	61° 0	53° 6	66° 0	46° 0	3rd	69° 6	28th	454	93° 2	79° 3	16th
December -	30° 103	59° 0	50° 7	62° 9	43° 1	31st	70° 1	6th	419	93° 0	86° 2	26th
Mean -	30° 064	63° 6	55° 9	69° 0	49° 2	—	75° 8	—	515	88° 7	73° 5	—

## SCUTARI CEMETERY.

Lat. 41° 0' N.

January -	30° 104	55° 9	34° 6	46° 3	28° 6	6th	53° 4	16th	197	90° 8	62° 0	16th
February -	30° 060	55° 7	38° 0	48° 7	30° 0	28th	59° 8	19th	229	85° 0	65° 2	23th
March -	29° 947	55° 4	40° 0	53° 1	29° 8	2nd	64° 8	21st	236	78° 8	59° 4	19th
April -	29° 874	58° 3	41° 1	65° 4	32° 6	1st	78° 8	9th	310	68° 5	47° 4	9th
May -	29° 893	66° 9	54° 0	77° 8	46° 6	17th	86° 4	15th	420	64° 8	49° 4	2nd
June -	29° 853	71° 2	59° 5	84° 3	52° 6	15th	90° 4	21st	493	59° 5	39° 6	14th
July -	29° 816	77° 0	65° 3	90° 9	57° 8	29th	100° 4	22nd	583	57° 5	40° 0	24th
August -	29° 875	75° 3	63° 5	89° 9	58° 2	1st	97° 8	21st	521	54° 5	45° 2	13th
September -	29° 958	72° 4	59° 6	82° 2	54° 2	3rd	95° 2	1st	484	60° 6	41° 8	1st
October -	29° 963	68° 7	56° 5	74° 4	39° 0	31st	84° 4	14th	452	71° 0	49° 8	23th
November -	30° 048	60° 7	49° 5	62° 0	43° 4	28th	69° 6	5th	342	78° 3	61° 0	1st
December -	30° 073	59° 6	40° 0	51° 0	28° 0	27th	64° 2	10th	245	81° 1	62° 8	28th
Mean -	29° 955	64° 7	50° 4	68° 7	41° 7	—	78° 7	—	376	70° 0	51° 9	—

No. XXI.

at Netley and Foreign Stations in the Year 1885.

Long. 1° 20' W. Height of Barometer Cistern above Sea, 47 feet.

Mean amount of Cloud.	Rainfall.			Weather.								Wind.								
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.								
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
8.0	2.50	0.47	31st	14	—	—	—	1	1.5	23.0	1	2.5	7.0	3.0	5.0	1.5	8.0	1.0	2.0	1.0
7.0	3.67	0.50	9th	20	—	—	—	—	3.5	16.5	—	—	1.0	0.5	1.0	3.5	16.0	1.5	1.5	3.0
5.8	1.79	0.75	3rd	8	1	—	—	—	6.5	12.5	—	0.5	12.5	1.5	4.5	0.5	4.5	0.5	3.5	3.0
5.3	1.54	0.35	5th	14	—	—	—	—	6.5	9.5	1	1.5	10.0	1.0	2.0	1.0	7.5	—	4.0	3.0
6.5	3.44	0.70	5th	17	—	—	—	—	2.0	10.5	—	2.0	2.5	0.5	3.0	1.0	13.0	3.0	6.0	—
5.4	1.46	0.55	16th	11	—	—	—	—	8.5	10.0	—	2.0	10.5	0.5	5.0	0.5	8.5	0.5	2.5	—
4.5	0.35	0.15	19th	6	—	—	—	—	16.5	8.0	—	1.0	6.5	1.0	3.0	0.5	12.0	2.5	4.5	—
5.0	0.82	0.20	7th	9	—	—	—	—	8.0	5.5	—	1.0	14.0	—	4.0	—	7.5	1.5	2.0	1.0
6.0	13.94	1.10	10th	19	—	—	—	3	4.0	11.5	—	0.5	3.0	—	2.0	1.0	15.5	0.5	7.5	—
5.9	3.78	0.65	23rd	17	—	—	—	1	7.5	13.5	—	1.5	4.5	1.0	3.5	0.5	6.0	1.5	12.5	—
7.5	3.04	0.50	26th	15	—	—	—	—	6.5	20.5	2	1.5	11.5	4.5	1.0	—	8.5	1.5	1.5	—
6.8	1.57	0.50	5th	11	—	—	—	—	8.5	21.0	1	4.0	4.5	1.0	3.0	1.5	17.0	3.5	5.0	1.5
6.1	3.16	0.53	—	13.4	0.08	—	—	0.4	6.6	13.5	0.4	1.5	7.3	1.2	3.1	0.9	0.5	1.4	4.4	1.0

Long. 5° 20' 53" W. Height of Barometer Cistern above Sea, 53 feet.

5.0	5.04	0.99	30th	19	—	—	—	—	8.5	6.5	—	—	6.0	7.5	—	—	2.0	4.5	10.5	0.5
4.5	4.50	1.55	17th	10	—	—	—	—	10.0	3.5	—	—	6.0	4.0	1.5	—	7.0	1.5	8.0	—
4.7	4.94	1.15	31st	15	—	—	—	—	8.5	3.5	—	—	2.0	6.5	1.0	1.0	2.0	7.5	11.0	—
3.5	5.50	1.20	20th	16	—	—	—	—	13.0	—	—	—	3.0	—	0.5	—	4.0	12.5	9.5	0.5
2.5	—	—	—	—	—	—	—	—	17.5	—	—	—	15.5	—	—	—	2.0	9.0	4.5	—
4.2	0.40	0.20	29th	4	—	—	—	—	12.0	—	—	—	11.5	0.5	—	—	5.5	7.5	4.5	0.5
3.0	—	—	—	—	—	—	—	—	18.5	—	—	—	11.5	3.0	—	—	3.0	7.0	6.0	—
4.1	1.56	1.50	28th	2	—	—	—	—	12.0	1.0	—	—	7.0	3.0	—	—	3.0	12.5	5.5	—
4.0	0.04	0.03	22nd	2	—	—	—	—	12.0	—	—	—	13.5	5.0	—	—	1.5	6.0	4.0	—
4.0	2.45	0.70	18th	8	—	—	—	—	13.5	1.0	—	—	4.5	4.0	—	—	2.0	4.0	16.5	—
5.1	4.00	1.32	22nd	11	—	—	—	—	6.0	1.5	—	—	12.5	0.5	—	—	1.0	3.5	12.5	—
4.7	15.65	0.90	11th	12	—	—	—	—	5.5	0.5	—	—	14.0	3.0	1.0	—	1.5	4.0	7.5	—
4.1	3.73	1.29	—	8.2	—	—	—	—	10.3	3.0	—	—	8.9	3.1	0.3	0.08	2.9	6.6	8.4	0.1

Long. 29° 3' E. Height of Barometer Cistern above Sea, 60 feet.

6.8	2.04	0.43	9th	16	2	—	—	—	6.0	18.0	—	3.0	21.0	1.5	3.0	1.0	1.5	—	—	—
7.5	1.96	0.61	4th	15	2	—	—	—	5.0	18.0	—	7.5	10.5	2.0	2.0	1.0	3.0	0.5	—	1.5
7.5	1.60	0.57	14th	14	3	—	—	2	6.5	20.0	—	6.0	7.5	3.5	2.0	3.5	4.5	2.5	1.0	0.5
4.8	1.55	1.16	4th	6	—	1	1	—	11.5	9.0	—	6.0	5.5	2.5	1.0	6.0	4.0	2.0	0.5	2.5
4.3	0.51	0.20	16th	5	—	—	3	—	14.0	7.0	—	4.0	8.0	3.0	—	5.0	7.5	0.5	—	3.0
4.0	0.40	0.21	26th	5	—	—	6	1	14.5	5.0	—	2.5	10.5	3.5	0.5	2.5	9.5	—	—	1.0
3.7	0.87	0.31	27th	5	—	—	3	1	16.0	6.0	—	8.5	12.0	2.5	—	2.0	5.0	0.5	—	0.5
2.2	0.01	0.01	26th	1	—	—	—	—	20.0	1.0	—	5.5	10.5	3.5	—	5.0	4.0	—	—	2.5
3.4	1.64	1.05	13th	5	—	—	1	1	16.5	5.0	—	6.5	7.0	6.0	0.5	4.5	4.0	0.5	—	1.0
5.0	2.71	0.71	22nd	11	—	—	1	1	12.5	11.5	—	4.5	5.5	3.5	0.5	5.0	6.0	1.0	—	5.0
6.7	2.50	0.85	11th	19	—	—	—	—	6.0	15.5	—	2.0	9.0	2.5	—	3.5	4.5	0.5	0.5	1.5
6.8	3.50	0.64	12th	18	2	7	—	1	7.5	18.5	—	11.5	5.0	2.5	—	4.0	5.5	1.5	—	1.0
5.2	1.61	0.56	—	10.0	0.7	0.6	1.2	0.6	11.3	11.2	—	5.6	9.3	3.5	8.0	3.6	4.9	8.0	0.1	1.6



## Annual Abstract of Meteorological Observations taken

NICOSIA, CYPRUS.\*

Lat. 35° 10' 50" N.

Month.	Mean Pressure.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.		Per Cent.		Minimum.		
			Min.	Max.	Temp.	Day.	Temp.	Day.			Mean.	Per Cent.	Day.
January . . . . .	}												
February . . . . .													
March . . . . .													
April . . . . .													
May . . . . .													
June . . . . .													
July . . . . .													
August . . . . .													
September . . . . .	—	—	56°0	92°8	49°0	17th	94°2	26th	*649	47°4	27°0	16th	
October . . . . .	—	—	49°6	82°8	43°0	16th	90°0	16th	*417	75°0	43°0	8th	
November . . . . .	—	—	43°9	65°9	35°0	5th	77°0	4th	*368	81°6	61°9	5th	
December . . . . .													
Mean . . . . .	—	—	49°8	80°5	42°6	—	87°0	—	*478	68°0	44°0	—	

\* 3 months only.

† 19 days only.

POLYMEDIA, CYPRUS.\*

Lat. 34° 40' N.

January -	29°982	52°0	45°4	62°9	36°5	3rd	69°0	10th	*303	77°0	57°6	8th
February	30°017	51°0	47°7	66°1	43°2	2nd	71°0	21st	*341	73°0	57°0	18th
March	29°946	60°0	50°0	71°4	38°8	17th	83°2	15th	*383	67°7	50°5	26th
April	29°886	68°0	53°3	77°7	47°5	1st	94°5	26th	*454	62°8	34°0	18th
May	29°913	79°0	62°6	91°0	53°5	3rd	101°2	18th	*600	55°0	28°3	8th
June												
July												
August												
September												
October	30°028	79°2	62°4	80°9	51°0	17th	96°5	20th	*581	54°8	31°1	14th
November	30°077	66°1	56°5	77°6	52°2	30th	88°0	10th	*505	68°0	51°5	8th
December	30°128	56°7	49°9	68°4	42°5	31st	76°5	14th	*384	76°7	57°0	18th
Mean	29°997	64°3	53°4	75°6	46°0	—	85°0	—	*444	66°8	46°0	—

\* 8 months only.

† 24 days only.

‡ 20 days only.

MOUNT TROADOS, CYPRUS.\*

Lat. 34° 57' N.

January -												
February												
March												
April												
May												
June	29°927	61°6	50°3	70°3	42°7	10th	76°0	25th	*319	59°0	41°3	27th
July	29°876	67°0	54°9	75°9	47°0	28th	85°0	26th	*416	63°2	45°6	30th
August	29°857	70°0	57°8	81°1	50°2	12th	88°4	6th	*420	57°4	26°8	21st
September	29°934	62°0	52°0	73°1	44°2	18th	85°3	3rd	*345	59°6	34°4	1st
October												
November												
December												
Mean	29°898	65°1	53°7	75°1	46°0	—	83°6	—	*375	59°8	37°0	—

\* 4 months only.

† 27 days only.

## No. XXI.—continued.

at Netley and Foreign Stations in the year 1885.

Long. 33° 21' 15" E. Height of Barometer Cistern above Sea, 592 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.								
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.								
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
1.2	—	—	—	—	—	—	—	—	—	—	—	—	6.0	3.0	—	—	4.0	3.0	2.0	—
4.5	—	—	—	—	—	—	—	—	9.0	6.0	—	1.0	6.0	5.0	3.0	3.0	2.0	5.0	3.0	—
5.2	1.74	0.50	30th	8	—	—	—	—	10.0	7.0	—	—	5.0	3.0	1.0	3.0	5.0	6.0	2.0	—
3.6	0.58	0.18	—	3	—	—	—	—	6.3	4.3	—	2.3	5.6	3.6	1.3	2.0	3.6	4.6	2.3	—

Long. 32° 2' E. Height of Barometer Cistern above Sea, 460 feet.

6.0	5.50	1.56	20th	15	—	1	2	—	8.0	13.0	—	7.0	4.0	8.0	3.0	—	—	4.0	5.0	—
6.6	8.07	2.11	9th	16	—	3	3	—	6.0	11.0	—	5.0	2.0	4.0	1.0	2.0	2.0	4.0	8.0	—
5.0	1.16	0.45	28th	6	—	—	2	—	11.0	6.0	—	3.0	2.0	6.0	—	2.0	4.0	10.0	4.0	—
3.5	0.26	0.13	21st	3	—	—	—	—	15.0	3.0	—	2.0	—	6.0	5.0	5.0	5.0	6.0	1.0	—
3.0	0.05	0.03	14th	2	—	—	—	—	15.0	3.0	—	—	1.0	2.0	5.0	5.0	6.0	4.0	1.0	—
1.3	—	—	—	—	—	—	—	—	18.0	4.0	2	—	4.0	2.5	2.5	1.0	1.5	7.5	1.0	—
4.7	4.25	1.85	14th	5	—	—	—	—	10.0	7.0	—	2.0	3.0	3.0	3.5	1.0	4.5	2.5	10.5	—
4.5	3.53	1.14	30th	11	1	1	2	1	12.0	10.0	1	4.0	7.0	2.5	2.0	1.0	3.0	4.0	7.5	—
4.2	2.86	0.91	—	7.2	0.1	0.6	1.5	0.1	11.8	7.1	0.3	2.8	2.8	4.2	2.7	2.1	3.2	5.2	4.7	—

Long. 32° 55' E. Height of Barometer Cistern above Sea, 5,720 feet.

3.7	0.77	0.31	12th	6	—	3	4	—	14.0	5.0	—	7.0	4.0	—	—	1.0	—	8.0	7.0	—
2.7	3.56	1.59	3rd	9	—	1	4	—	21.0	3.0	—	8.0	12.5	0.5	—	—	1.0	1.0	8.0	—
1.1	0.20	0.20	27th	1	—	—	—	—	26.0	2.0	—	8.5	17.5	1.0	—	—	—	1.0	3.0	—
3.0	2.74	1.25	23rd	5	—	1	—	—	25.0	4.0	—	7.0	12.0	2.0	—	—	1.0	6.0	2.0	—
2.6	1.81	0.83	—	5.2	—	1.2	2.0	—	21.5	3.5	—	7.6	11.5	0.8	—	0.2	0.5	4.0	5.0	—

## Annual Abstract of Meteorological Observations taken

MALTA.

Lat. 35° 53' 49" N.

Month.	Mean Pressure.	Air Temperature.							Tension of Vapour.	Relative Humidity.		
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Min.	
			Min.	Max.	Temp.	Day.	Temp.	Day.				
January .	29° 900	56° 0	50° 3	56° 8	48° 0	20th	65° 0	17th	317	76° 4	62° 6	12th
February .	29° 033	60° 0	51° 9	61° 2	52° 4	14th	72° 2	22nd	385	82° 7	67° 0	14th
March .	29° 911	62° 0	51° 0	64° 1	40° 0	1st	78° 4	11th	424	80° 8	56° 8	8th
April .	29° 780	64° 0	55° 6	68° 3	52° 4	14th	70° 0	10th	463	82° 8	73° 0	22nd
May .	29° 945	66° 0	59° 8	72° 7	55° 2	3rd	79° 0	12th	571	82° 6	60° 2	5th
June .	29° 971	74° 0	66° 5	74° 0	65° 4	4th	78° 4	29th	592	73° 8	51° 4	9th
July .	30° 016	79° 0	73° 3	79° 6	70° 0	4th	85° 4	7th	723	70° 6	47° 8	8th
August .	30° 101	82° 0	76° 7	84° 3	70° 0	27th	91° 4	8th	790	66° 0	34° 0	6th
September .	30° 052	79° 0	62° 4	78° 0	58° 2	10th	85° 4	27th	626	65° 4	48° 4	27th
October .	30° 015	73° 0	58° 2	71° 8	45° 0	20th	80° 6	3rd	590	72° 1	52° 6	31st
November .	29° 992	68° 0	58° 1	64° 0	50° 0	7th	69° 0	1st	449	74° 0	64° 0	21st
December .	30° 107	60° 0	52° 9	56° 7	43° 0	13th	65° 2	8th	349	74° 0	42° 4	16th
Mean .	29° 955	68° 6	59° 7	60° 3	53° 9	—	76° 6	—	522	75° 1	55° 0	—

## FORT NAPIER, NATAL.

Lat. 29° 3' S.

January -	29° 729	72° 0	56° 0	86° 7	53° 0	20th	106° 2	13th	565	75° 5	36° 0	7th
February -	29° 908	73° 0	62° 6	89° 3	59° 0	15th	102° 2	20th	533	64° 4	49° 0	2nd
March -	29° 778	69° 5	57° 3	84° 3	51° 0	3rd	103° 0	22nd	462	64° 9	40° 0	23rd
April -	29° 880	65° 0	53° 4	82° 3	43° 5	12th	95° 8	8th	415	62° 4	46° 5	20th
May -	30° 031	60° 0	47° 8	81° 5	39° 5	31st	94° 2	9th	328	58° 4	34° 0	13th
June -	30° 092	59° 0	48° 6	79° 4	35° 8	14th	89° 4	18th	288	56° 2	32° 0	24th
July -	30° 115	57° 0	45° 0	77° 0	39° 4	6th	87° 4	8th	311	64° 8	39° 2	9th
August -	30° 030	58° 0	48° 2	80° 1	37° 0	10th	95° 2	22nd	317	57° 6	38° 0	23rd
September -	30° 058	63° 3	52° 4	74° 6	39° 6	16th	98° 8	25th	381	65° 0	33° 4	25th
October -	30° 019	67° 0	55° 0	82° 2	44° 0	4th	106° 4	30th	432	58° 4	37° 0	28th
November -	29° 994	70° 9	59° 9	85° 2	49° 2	29th	108° 6	7th	495	60° 4	30° 0	7th
December -	29° 951	73° 0	63° 1	86° 1	55° 6	1st	101° 5	13th	579	65° 2	38° 0	19th
Mean	29° 965	65° 6	54° 1	82° 4	45° 6	—	99° 0	—	427	62° 7	37° 7	—

## SIERRA LEONE.

Lat. 8° 29' 30" N.

January -	29° 907	81° 0	82° 9	92° 8	76° 0	24th	98° 0	30th	916	90° 0	85° 0	6th
February -	29° 835	81° 0	80° 4	92° 4	74° 0	15th	97° 0	6th	933	92° 5	85° 0	26th
March -	29° 920	81° 9	83° 7	95° 7	80° 0	1st	97° 0	7th	977	89° 0	76° 0	25th
April -	29° 860	82° 3	80° 9	88° 4	78° 0	6th	97° 0	1st	968	90° 5	80° 0	6th
May -	29° 899	83° 1	83° 1	95° 6	70° 0	8th	98° 0	10th	928	85° 0	76° 0	3rd
June -	29° 930	82° 5	83° 8	95° 8	72° 0	22nd	98° 0	5th	980	83° 8	72° 0	7th
July -	29° 916	82° 7	82° 3	95° 3	70° 0	4th	97° 0	14th	972	85° 5	76° 0	4th
August -	29° 901	83° 8	83° 4	95° 3	76° 0	12th	98° 0	5th	950	81° 5	68° 0	12th
September -	29° 910	82° 4	84° 0	95° 8	74° 0	11th	98° 0	20th	930	88° 1	78° 0	9th
October -	29° 924	81° 5	80° 8	96° 3	73° 0	23rd	98° 0	4th	916	90° 0	80° 0	16th
November -	29° 914	82° 6	81° 5	94° 4	70° 0	13th	97° 0	5th	957	83° 5	65° 0	13th
December -	29° 881	81° 8	80° 6	89° 6	70° 0	11th	97° 0	11th	959	92° 0	85° 0	19th
Mean	29° 904	82° 2	82° 2	93° 9	73° 4	—	97° 5	—	943	87° 5	76° 1	—

No. XXI.—continued.

at Netley and Foreign Stations in the Year 1885.

Long. 14° 30' 54" E. Height of Barometer Cistern above Sea, 70 feet.

Mean Amount of Cloud.	Rainfall.			Weather.									Wind.										
	Total.	Max.	Day.	Number of Days of									Number of Observations under each Point.										
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.			
5.0	4.07	1.93	25th	11	—	—	—	—	—	5.0	8.0	—	—	—	2.0	1.0	4.0	—	10.0	1.0	13.0	—	—
3.5	0.28	0.14	13th	5	—	—	—	—	—	16.0	3.0	—	—	—	2.0	1.0	2.0	1.0	7.0	2.0	13.0	—	—
3.0	0.10	0.10	30th	1	—	—	—	—	—	20.0	1.0	—	1.0	4.0	2.0	5.0	1.0	2.0	5.0	11.0	—	—	
3.0	0.55	0.20	4th	6	—	—	—	—	—	16.0	13.0	—	3.0	1.0	4.0	5.0	3.0	5.0	6.0	3.0	—	—	
2.0	—	—	—	—	—	—	—	—	—	24.0	1.0	—	2.0	4.0	4.0	2.0	3.0	2.0	7.0	7.0	—	—	
2.0	—	—	—	—	—	—	—	—	—	22.0	—	8	—	7.0	3.0	4.0	1.0	1.0	3.0	11.0	—	—	
0.7	0.02	0.02	8th	1	—	—	—	—	—	23.0	—	—	1.0	9.0	1.0	3.0	—	3.0	1.0	13.0	—	—	
1.0	0.08	0.08	16th	1	—	—	—	—	—	31.0	—	—	1.0	5.0	2.0	5.0	1.0	2.0	2.0	13.0	—	—	
2.7	0.30	0.30	9th	1	—	—	—	—	—	17.0	—	—	1.0	7.0	2.0	4.0	1.0	4.0	1.0	11.0	—	—	
4.5	0.68	0.23	30th	5	—	—	1.0	—	—	8.0	4.0	—	—	2.0	2.0	3.0	1.0	7.0	3.0	13.0	—	—	
5.2	3.59	0.95	7th	10	—	—	1.0	—	—	7.0	2.0	—	—	1.0	1.0	4.0	2.0	7.0	2.0	13.0	—	—	
6.3	2.65	0.96	4th	6	—	—	—	—	—	4.0	9.0	—	2.0	5.0	1.0	5.0	—	5.0	1.0	12.0	—	—	
3.1	1.01	0.41	—	3.9	—	—	0.1	—	—	16.5	3.4	0.6	0.8	4.1	2.0	3.8	1.1	4.6	2.8	11.1	—	—	

Long. 30° 2' E. Height of Barometer Cistern above Sea, 2,294 feet.

5.5	5.72	1.48	25th	11	—	—	—	—	9.5	10.5	—	0.5	7.0	11.5	8.5	2.0	1.0	0.5	—	—	—
4.8	4.24	1.75	23rd	9	—	—	—	—	9.5	12.0	—	3.5	4.0	10.5	5.0	4.0	—	—	1.0	—	—
3.9	3.47	1.12	15th	9	—	—	4	—	15.0	7.5	—	2.0	8.0	6.5	3.5	3.0	—	0.5	1.5	—	6.0
3.9	1.02	0.58	3rd	3	—	—	—	—	14.5	6.0	—	2.0	3.0	5.0	6.0	5.0	3.0	4.5	1.5	—	—
2.6	0.24	0.09	24th	4	—	—	—	—	20.0	3.5	—	4.0	7.5	1.5	4.0	9.0	0.5	1.5	3.0	—	—
2.3	0.69	0.61	24th	2	—	—	—	—	21.5	8.5	—	2.0	5.0	5.0	2.5	11.5	0.5	1.0	2.5	—	—
3.8	—	—	—	—	—	—	—	—	21.0	7.5	—	—	4.5	6.0	3.5	10.5	3.0	1.5	1.0	—	—
3.2	1.06	0.45	1st	3	—	—	1	—	19.0	7.0	—	3.0	4.5	6.0	3.5	9.0	2.0	2.5	0.5	—	—
5.0	3.39	1.38	10th	11	—	—	2	—	11.0	12.0	—	1.0	1.0	10.0	4.5	12.0	1.0	—	0.5	—	—
5.3	2.88	0.73	9th	10	—	—	2	—	11.5	12.5	—	5.5	5.0	5.5	5.5	6.0	1.0	1.0	1.5	—	—
6.7	5.84	1.70	16th	14	—	—	10	—	8.5	19.0	—	8.0	9.0	4.0	3.5	2.0	0.5	—	3.0	—	—
7.1	8.36	1.54	8th	21	—	—	1	15	5.5	19.0	2	3.5	13.0	3.5	8.0	2.5	0.5	—	—	—	—
4.4	3.06	0.95	—	8.1	—	—	0.8	3.2	—	13.8	10.4	16	2.9	5.9	6.3	4.8	6.3	1.1	1.1	1.3	0.5

Long. 13° 9' 17" W. Height of Barometer Cistern above Sea, 224 feet.

2.0	0.32	0.15	7th	3	—	—	1	—	27.0	—	—	6.0	—	6.0	2.0	9.0	2.0	6.0	—	—	—
2.1	0.30	0.30	23rd	1	—	—	—	—	27.0	—	—	6.0	1.0	6.0	1.0	9.0	1.0	4.0	1.0	—	—
3.3	1.28	0.63	26th	3	—	—	3	—	25.0	—	—	9.0	—	7.0	1.0	9.0	2.0	2.0	1.0	—	—
2.6	1.16	0.70	26th	4	—	—	2	—	24.0	—	—	8.0	1.0	3.0	2.0	7.0	3.0	6.0	—	—	—
3.6	7.03	1.60	13th	12	—	—	9	—	12.0	—	—	7.0	—	7.0	—	9.0	—	8.0	—	—	—
3.9	19.84	6.45	10th	21	—	—	10	—	6.0	—	—	6.0	1.0	3.0	2.0	7.0	3.0	2.0	1.0	5.0	—
3.1	42.99	6.20	26th	21	—	—	8	—	11.0	—	—	2.0	—	5.0	1.0	9.0	3.0	3.0	2.0	6.0	—
1.9	47.51	7.70	3rd	26	—	—	3	—	2.0	—	—	7.0	—	5.0	1.0	11.0	1.0	5.0	—	1.0	—
2.4	39.15	8.00	11th	18	—	—	5	—	7.0	—	—	11.0	—	4.0	1.0	8.0	—	2.0	—	4.0	—
—	8.58	3.00	13th	15	—	—	8	—	8.0	—	—	7.0	—	4.0	1.0	7.0	—	3.0	1.0	8.0	—
—	8.42	2.50	3rd	14	—	—	14	—	2.0	—	—	6.0	—	3.0	—	5.0	3.0	1.0	3.0	9.0	—
—	2.37	1.30	7th	5	—	—	1	—	26.0	—	—	11.0	1.0	5.0	1.0	10.0	1.0	1.0	—	1.0	—
2.6	14.07	3.21	—	11.9	—	—	5.3	—	14.7	—	—	7.1	0.3	4.7	1.1	8.3	1.5	3.5	0.7	2.8	—

H H 2

## Annual Abstract of Meteorological Observations taken

BARBADOS.

Lat. 13° 7' 39" N.

Month.	Mean Pressure.	Air Temperature.							Tension of Vapour.	Relative Humidity.	
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.			Per Cent.	Min.
			Min.	Max.	Temp.	Day.	Temp.	Day.			
January -	30°066	81°2	77°0	84°5	70°0	15th	86°0	7th	670	63·5	51°0
February -	30°061	81°3	77·7	86°9	73°0	15th	89°5	27th	719	69°0	54°0
March -	30°019	81°0	77°0	86°4	75°0	9th	89°0	23rd	684	63·6	42°4
April -	30°036	81°1	—	85°7	—	—	90°0	11th	694	63°0	53°4
May -	30°025	81°6	—	87°4	—	—	90°0	11th	724	64°0	56°4
June -	30°063	81°7	—	86°9	—	—	90°0	21st	753	66°3	55°4
July -	30°025	82°0	—	83°0	—	—	90°0	3rd	743	63·2	54°4
August -	30°005	82°2	—	87°0	—	—	91°0	11th	788	67°3	57°4
September -	29°972	82°1	—	86°0	—	—	90°0	28th	831	71°2	60°4
October -	30°012	82°7	—	89°2	—	—	92°0	23rd	779	63°7	51°4
November -	29°989	82°3	—	87°2	—	—	90°0	27th	850	73°6	53°4
December -	30°012	81°0	—	86°1	—	—	88°0	3rd	782	70°8	53°4
Mean -	30°023	81°7	78°5*	86°7	71°3*	—	89°6	—	752	66·6	55°0

\* 3 months only.

UPPER-PARK CAMP, JAMAICA.

Lat. 17° 59' N.

January -	30°102	80°0	66°9	—	62°0	28th	—	—	672	60°9	53°1
February -	30°037	80°0	66°6	—	64°0	20th	—	—	682	59°7	53°1
March -	30°111	81°0	67°4	—	64°0	1st	—	—	709	59°2	54°1
April -	30°059	81°0	68°0	—	65°0	24th	—	—	741	61°6	54°1
May -	29°972	83°0	68°8	—	67°0	7th	—	—	742	59°8	51°1
June -	30°046	83°0	72°4	—	70°0	8th	—	—	847	66°3	54°1
July -	30°141	85°0	73°0	—	70°0	27th	—	—	811	61°7	56°1
August -	30°023	84°0	60°4	—	58°0	4th	—	—	820	61°4	40°4
September -	30°073	85°7	67°8	—	66°0	13th	—	—	639	62°5	38°2
October -	30°103	80°0	66°9	—	62°0	12th	—	—	672	60°9	53°1
November -	30°091	86°0	72°4	—	70°0	8th	—	—	806	63°2	46°0
December -	30°088	79°0	—	—	—	—	—	—	—	—	—
Mean -	30°070	82°3	65°2	—	65°2	—	—	—	740	60°9	50°3

\* Instruments removed owing to heavy gale.

NEWCASTLE, JAMAICA.

Lat. 18° 6' N.

January -	30°240	62°0	Instruments have not been replaced.		—	—	—	—	—	—	—
February -	30°203	63°0			—	—	—	—	—	—	—
March -	30°224	63°0			—	—	—	—	—	—	—
April -	30°196	63°0			—	—	—	—	—	—	—
May -	30°210	67°0			—	—	—	—	—	—	—
June -	30°237	68°0			—	—	—	—	—	—	—
July -	30°256	70°0			—	—	—	—	—	—	—
August -	30°241	70°0			—	—	—	—	—	—	—
September -	30°202	64°0			—	—	—	—	—	—	—
October -	30°220	63°0			—	—	—	—	—	—	—
November -	30°196	65°0			—	—	—	—	—	—	—
December -	30°183	63°0	—	76°0*	—	—	85°0*	26th	—	—	—
Mean -	30°217	65°1	—	—	—	—	—	—	—	—	—

\* 1 month only.

No. XXI.—continued.

at Netley and Foreign Stations in the Year 1885.

Long. 59° 40' 8" W. Height of Barometer Cistern above Sea, 30 feet.

Mean Amount of Cloud.	Rainfall.			Weather.									Wind.										
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.											
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.			
2.3	1.03	0.20	9th	11	—	—	—	—	—	25.0	4.0	—	—	—	17.0	14.0	—	—	—	—	—	—	—
3.3	2.17	1.02	23rd	10	—	—	—	—	—	23.0	2.0	—	—	—	12.5	15.5	—	—	—	—	—	—	—
4.4	0.97	0.22	3rd	9	—	—	—	—	—	5.5	0.5	—	—	—	28.5	2.5	—	—	—	—	—	—	—
3.4	0.92	0.20	1st	11	—	—	—	—	—	17.0	12.0	—	—	—	25.0	1.0	—	—	—	—	—	—	—
3.8	2.96	0.93	31st	7	—	—	—	—	—	2.0	23.0	—	—	—	27.0	4.0	—	—	—	—	—	—	—
4.4	1.37	0.22	7th	6	—	—	—	—	—	26.0	—	—	—	—	30.0	—	—	—	—	—	—	—	—
4.6	3.72	0.45	5th	14	—	—	5	—	—	12.0	—	—	—	—	31.0	—	—	—	—	—	—	—	—
5.0	4.71	0.80	14th	18	—	—	4	—	—	—	9.0	—	—	—	29.0	2.0	—	—	—	—	—	—	—
5.2	4.45	0.80	12th	15	—	—	—	4	—	14.0	—	—	—	—	30.0	—	—	—	—	—	—	—	—
4.5	3.36	0.80	14th	9	—	—	—	—	—	18.0	10.0	—	4.0	—	26.0	1.0	—	—	—	—	—	—	—
4.2	6.94	0.65	17th	24	—	—	—	—	—	13.0	4.0	—	—	—	25.0	—	—	—	4.0	—	—	1.0	—
3.1	1.71	0.59	1st	9	—	—	—	—	—	17.0	5.0	—	—	—	30.0	—	—	—	—	—	—	1.0	—
4.0	2.85	0.56	—	11.9	—	—	0.7	—	—	14.3	5.8	—	0.3	26.2	3.3	—	—	0.3	—	—	0.18	—	—

Long. 76° 56' W. Height of Barometer Cistern above Sea, 245 feet.

3.0	0.60	0.50	26th	3	—	—	—	—	25.0	2.5	—	0.5	6.0	—	16.0	1.0	2.5	—	2.0	3.0
3.0	2.00	1.50	12th	3	—	—	—	—	24.5	2.0	—	—	2.5	—	17.5	—	1.5	—	2.0	4.5
3.5	0.40	0.20	28th	4	—	—	—	—	24.5	5.0	—	1.0	0.5	—	17.5	1.0	7.0	0.5	0.5	2.0
2.9	3.10	1.00	19th	9	—	—	—	—	24.0	4.5	—	—	—	—	25.0	1.0	3.5	—	—	0.5
1.8	4.52	2.50	26th	3	—	—	2	—	28.0	1.5	—	—	0.5	—	27.0	2.0	1.5	—	—	—
3.1	2.55	1.00	3rd	7	—	—	—	—	28.0	3.0	—	—	0.5	—	31.5	1.0	3.5	—	—	1.0
1.7	3.20	1.70	20th	4	—	—	3	—	29.0	2.0	—	—	0.5	—	31.5	1.0	3.5	1.0	2.0	1.5
3.6	2.85	0.50	5th	8	—	—	3	—	22.0	4.5	—	0.5	1.0	—	18.0	2.0	7.0	—	—	2.5
4.7	8.43	3.14	26th	9	—	—	3	—	11.5	—	—	—	1.0	—	22.0	2.0	2.0	3.0	—	—
3.1	13.63	2.97	5th	9	—	—	4	—	22.0	4.0	—	—	1.0	—	20.0	4.5	4.0	0.5	0.5	0.5
2.2	0.57	0.57	18th	1	—	—	—	—	27.5	—	—	—	1.5	—	11.0	2.0	6.0	4.5	2.5	2.5
3.2	14.40	5.63	23rd	7	—	—	5	—	22.0	2.5	—	—	—	—	—	—	—	—	—	—
2.6	4.89	1.68	—	5.5	—	—	1.6	—	23.8	2.6	—	0.1	1.3	0.1	19.7	1.6	3.7	0.8	1.1	1.6

Long. 76° 42' W. Height of Barometer Cistern above Sea, 3,800 feet.

4.8	4.41	2.75	26th	5	—	—	—	—	11.0	7.5	—	8.5	8.0	6.0	—	—	—	0.5	5.0	3.0
5.2	3.46	0.70	5th	9	—	—	—	—	8.5	5.5	—	8.0	8.5	2.0	—	—	1.5	1.5	3.0	3.5
4.5	2.38	0.80	27th	9	—	—	—	1	15.5	7.0	8.5	1.5	10.0	5.5	3.0	1.0	5.0	3.0	1.0	1.0
5.7	5.62	0.75	9th	18	—	—	—	—	11.0	10.0	—	5.5	7.0	3.5	4.0	—	6.0	1.0	1.5	2.5
4.0	7.07	0.96	27th	11	—	—	—	—	13.5	6.5	—	1.0	3.5	1.0	11.0	0.5	7.0	3.5	1.5	2.0
3.0	3.26	1.47	18th	4	—	—	—	3	24.0	2.5	—	0.5	3.5	—	7.5	3.0	10.5	0.5	4.0	0.5
4.0	12.81	1.76	19th	11	—	—	—	11	20.0	4.0	—	2.0	4.0	0.5	5.0	4.5	6.5	1.5	3.5	3.5
3.6	19.98	3.36	5th	15	—	—	—	10	20.5	4.5	—	—	5.5	—	1.5	4.0	4.5	2.5	5.5	7.5
4.4	11.30	2.10	29th	18	—	—	—	10	13.0	12.5	—	—	0.5	7.0	—	4.5	7.0	4.0	2.0	5.0
4.2	7.05	1.25	9th	15	—	—	—	8	19.0	10.5	—	—	3.5	11.5	—	2.5	1.0	—	7.5	5.0
4.2	8.85	4.75	15th	14	—	—	—	11	15.0	5.5	1.0	—	6.0	12.0	—	0.5	—	—	10.0	1.5
5.1	25.27	11.03	22nd	9	—	—	—	6	11.5	9.5	—	—	13.0	12.5	—	—	—	—	4.0	1.5
4.5	8.87	2.29	—	11.5	—	—	5.5	—	15.5	7.2	0.8	4.1	7.7	1.4	1.6	1.7	4.1	1.5	4.0	3.0

## Annual Abstract of Meteorological Observations taken

NASSAU, BAHAMAS.

Lat. 25° 5' N.

Month.	Mean Pressure.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.		Per Cent.		Min.		
			Min.	Max.	Temp.	Day.	Temp.	Day.	Mean.		Per Cent.	Day.	
January -	30° 153	75° 0	66° 9	80° 2	62° 0	9th	83° 5	2nd	648	75° 3	59° 8	59° 8	
February -	30° 056	72° 0	64° 0	77° 4	57° 0	11th	84° 5	10th	554	75° 4	59° 0	59° 0	
March -	30° 119	73° 3	64° 5	79° 6	59° 0	14th	88° 6	29th	622	73° 2	55° 4	55° 4	
April -	30° 060	76° 0	68° 4	82° 3	64° 0	25th	88° 2	12th	679	72° 2	57° 4	57° 4	
May -	30° 001	80° 0	71° 9	86° 2	66° 0	15th	90° 0	22nd	733	74° 0	51° 2	51° 2	
June -	30° 034	82° 0	75° 0	91° 5	67° 8	3rd	101° 0	29th	862	73° 6	66° 2	66° 2	
July -	30° 101	85° 0	75° 8	92° 6	68° 5	23rd	98° 5	15th	900	70° 0	61° 8	61° 8	
August -	30° 048	85° 0	76° 4	93° 0	72° 5	10th	95° 5	3rd	900	69° 8	53° 0	53° 0	
September -	29° 992	84° 6	75° 1	90° 6	72° 0	8th	96° 2	1st	838	68° 4	58° 9	58° 9	
October -	30° 001	80° 0	72° 3	87° 6	64° 0	31st	96° 0	26th	674	66° 4	49° 1	49° 1	
November -	30° 053	78° 0	69° 7	84° 5	58° 0	22nd	91° 0	5th	663	71° 0	51° 5	51° 5	
December -	30° 118	71° 8	65° 6	78° 9	56° 0	27th	94° 8	14th	530	70° 6	53° 5	53° 5	
Mean	30° 066	78° 3	70° 4	85° 3	63° 7	—	92° 1	—	724	71° 6	57° 1	—	

BERMUDA.

Lat. 32° 17' 40" N.

January -	30° 197	66° 0	—	70° 6	—	—	75° 6	11th	527	87° 7	67° 0	67° 0	11th
February -	29° 920	66° 0	—	71° 0	—	—	79° 8	12th	492	79° 0	61° 0	61° 0	12th
March -	29° 968	67° 0	—	70° 9	—	—	76° 8	17th	505	80° 5	64° 8	64° 8	17th
April -	30° 028	71° 0	57° 0	76° 6	47° 0	26th	97° 4	30th	617	78° 0	56° 2	56° 2	30th
May -	30° 320	76° 0	—	81° 5	—	—	84° 2	10th	843	85° 0	70° 4	70° 4	10th
June -	30° 133	77° 0	—	86° 1	—	—	89° 8	15th	840	80° 7	54° 0	54° 0	15th
July -	30° 090	80° 0	—	86° 6	—	—	89° 2	23rd	840	80° 7	63° 3	63° 3	23rd
August -	30° 011	79° 0	—	87° 5	—	—	94° 0	12th	708	84° 7	78° 0	78° 0	12th
September -	29° 065	79° 8	—	86° 5	60° 6	4th	90° 5	10th	867	92° 0	80° 6	80° 6	10th
October -	29° 929	71° 2	—	69° 1	—	—	79° 3	27th	658	70° 0	68° 9	68° 9	27th
November -	29° 983	68° 0	—	73° 4	—	—	78° 0	15th	610	83° 5	72° 2	72° 2	15th
December -	30° 064	64° 2	42° 5	70° 1	36° 0	26th	74° 5	8th	534	83° 5	64° 0	64° 0	8th
Mean -	29° 975	72° 10	—	77° 50	—	—	83° 21	—	695	82° 1	66° 48	—	—

SINGAPORE.

Lat. 1° 16' N.

January -	29° 027	79° 0	67° 0	94° 7	64° 0	17th	99° 2	15th	827	72° 4	52° 8	52° 8	15th
February -	29° 025	79° 0	66° 2	93° 4	62° 4	2nd	99° 6	9th	872	79° 6	60° 2	60° 2	9th
March -	29° 015	81° 0	67° 1	93° 1	62° 8	14th	96° 8	19th	872	74° 4	65° 8	65° 8	19th
April -	29° 003	82° 0	69° 7	93° 6	67° 4	26th	97° 2	29th	942	76° 0	64° 2	64° 2	29th
May -	29° 001	82° 0	70° 5	92° 9	67° 0	13th	97° 2	9th	982	82° 3	67° 4	67° 4	9th
June -	29° 033	81° 0	70° 4	90° 6	60° 0	6th	94° 8	17th	1008	93° 5	80° 2	80° 2	17th
July -	29° 075	81° 6	66° 8	87° 8	64° 2	4th	94° 8	27th	965	85° 5	76° 0	76° 0	27th
August -	29° 046	81° 6	69° 7	92° 9	63° 6	18th	98° 0	29th	909	79° 1	69° 2	69° 2	29th
September -	29° 081	81° 7	70° 3	93° 3	65° 6	19th	97° 6	15th	990	85° 0	72° 2	72° 2	15th
October -	29° 091	81° 0	69° 6	94° 5	67° 4	22nd	97° 2	7th	972	76° 8	63° 2	63° 2	7th
November -	29° 098	80° 0	69° 6	94° 4	66° 4	29th	99° 2	26th	917	77° 2	66° 6	66° 6	26th
December -	29° 082	80° 0	67° 9	94° 4	66° 2	12th	99° 8	15th	960	81° 5	68° 4	68° 4	15th
Mean -	29° 048	80° 8	68° 7	92° 9	64° 7	—	97° 5	—	938	80° 2	66° 4	—	—

## No. XXI.—continued.

at Netley and Foreign Stations in the Year 1885.

Long. 77° 21' W. Height of Barometer Cistern above Sea, 47 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.										
	Totl.	Max.	Day.	Number of Days of								Number of Observations under each Point										
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.		
5.6	2.73	0.77	29th	7	—	—	—	1	—	2.0	7.0	—	0.5	7.0	4.0	10.0	5.5	3.5	—	0.5	—	—
5.7	5.14	2.15	18th	11	—	—	—	—	—	1.0	11.5	—	1.0	8.5	1.0	4.0	2.0	5.0	0.5	6.0	—	—
5.8	0.95	0.37	31st	6	—	—	—	—	—	5.0	7.0	—	3.5	6.0	6.0	2.5	2.5	5.0	0.5	5.0	—	—
5.9	1.40	0.59	1st	8	—	—	—	1	—	3.5	8.0	—	2.0	12.5	5.0	3.5	2.0	1.5	1.5	2.0	—	—
7.1	7.75	2.45	31st	16	—	—	—	3	—	0.5	14.5	—	1.0	5.5	4.0	11.5	2.5	4.5	—	2.0	—	—
5.8	3.98	1.45	1st	14	—	—	—	1	—	0.5	6.0	—	1.0	1.0	3.5	17.5	5.5	1.0	—	0.5	—	—
5.4	4.17	1.85	23rd	16	—	—	—	4	—	3.0	6.0	—	—	2.5	13.0	8.5	1.5	2.5	2.0	1.0	—	—
6.2	2.49	0.50	24th	16	—	—	—	3	—	1.5	9.0	—	1.5	2.0	6.5	13.5	4.5	2.0	—	1.0	—	—
5.7	9.11	3.90	27th	15	—	—	—	3	—	4.0	9.0	—	0.5	3.5	7.0	12.0	1.0	4.5	1.0	0.5	—	—
6.2	0.60	0.32	6th	2	—	—	—	—	—	5.0	21.0	—	1.0	13.5	4.0	2.0	0.1	3.0	2.0	4.5	—	—
5.2	1.16	0.25	29th	2	—	—	—	—	—	3.5	3.5	—	—	13.5	2.0	4.0	—	—	2.0	8.5	—	—
6.7	1.33	0.48	24th	13	—	1	—	—	—	4.5	15.0	2	2.5	11.5	6.0	3.0	3.0	1.0	1.5	2.5	—	—
5.9	3.40	1.31	—	10.5	—	0.8	1.3	—	—	2.8	9.8	16	1.2	7.2	5.1	7.6	2.5	2.8	0.9	2.8	—	—

Long. 64° 47' W. Height of Barometer Cistern above Sea, 151 feet.

5.6	3.47	0.68	2nd	16	—	—	1	—	2.0	5.0	—	3.0	6.0	1.0	3.0	1.0	12.0	1.0	4.0	—	—
5.7	4.66	0.80	28th	17	—	—	1	—	3.0	6.0	—	4.0	12.0	—	10.0	1.0	1.0	—	—	—	—
5.8	4.62	3.39	14th	7	—	—	1	—	22.0	3.0	—	7.0	1.0	—	2.0	8.0	8.0	2.0	3.0	—	—
5.9	1.10	0.70	25th	3	—	—	2	—	25.0	1.0	—	4.0	4.0	—	6.0	10.0	5.0	—	1.0	—	—
5.10	8.59	3.70	15th	5	—	—	1	—	26.0	—	—	2.0	2.0	—	10.0	7.0	10.0	—	—	—	—
5.11	0.20	0.20	29th	1	—	—	—	—	25.0	2.5	—	—	—	1.0	5.0	9.0	14.0	1.0	—	—	—
5.12	1.79	0.50	10th	5	—	—	2	—	25.0	—	—	1.0	1.0	1.0	4.0	8.0	13.0	3.0	—	—	—
5.13	4.70	1.60	9th	8	—	—	2	—	24.0	2.0	—	2.0	—	2.0	11.0	5.0	6.0	3.0	2.0	—	—
5.14	1.45	0.38	11th	10	—	—	1	—	3.0	3.0	—	2.0	1.0	1.0	9.0	4.0	11.0	1.0	1.0	—	—
5.15	1.64	0.98	30th	6	—	—	1	—	5.0	5.0	—	6.0	3.0	2.0	5.0	7.0	5.0	2.0	1.0	—	—
5.16	9.95	6.00	9th	15	—	—	2	—	—	7.0	—	4.0	3.0	—	5.0	2.0	6.0	3.0	7.0	—	—
5.17	4.76	2.58	25th	6	—	—	1	—	5.0	12.0	—	6.0	4.0	1.0	3.0	3.0	6.0	4.0	4.0	—	—
5.18	3.92	1.79	—	0.9	—	—	1.2	—	13.7	3.8	—	3.4	3.0	0.7	6.0	5.4	8.0	1.6	1.9	—	—

Long. 105° 31' E. Height of Barometer Cistern above Sea, 110 feet.

4.6	2.21	0.70	5th	8	—	—	—	—	9.0	2.0	—	7.0	18.5	—	—	—	—	—	5.5	—	—
5.7	5.59	1.06	13th	14	—	—	1	—	7.0	7.0	—	7.0	17.5	—	—	—	—	—	3.5	—	—
4.8	1.30	0.64	10th	4	—	—	—	—	22.0	9.0	—	4.0	18.5	—	—	—	—	—	2.0	—	—
5.4	3.69	2.11	13th	7	—	—	2	—	9.0	10.0	—	1.5	2.5	2.5	9.5	2.5	4.5	2.5	4.5	—	—
6.1	6.88	1.47	13th	13	—	—	1	—	3.0	20.0	—	1.5	0.5	0.5	5.0	3.0	13.0	3.5	4.0	—	—
6.2	9.23	1.75	10th	14	—	—	1	—	9.0	21.0	—	—	—	—	7.5	4.0	18.5	2.5	2.5	—	—
5.5	4.09	1.60	22nd	7	—	—	5	—	6.0	6.0	—	—	—	—	10.0	6.0	10.5	3.0	1.5	—	—
4.5	1.88	0.47	7th	8	—	—	1	—	12.0	4.0	1	—	—	—	9.0	3.0	14.0	3.5	1.5	—	—
5.3	4.18	1.14	17th	9	—	—	1	—	10.0	8.0	—	—	—	—	14.0	6.0	6.5	3.0	1.5	—	—
4.6	1.96	0.75	12th	7	—	—	1	—	6.0	1.0	—	1.0	0.5	—	3.5	4.5	17.0	3.0	1.5	—	—
4.6	8.91	2.30	7th	16	—	—	2	—	6.0	1.0	—	—	0.5	—	0.5	1.5	8.0	8.5	11.0	—	—
4.4	12.24	4.57	19th	21	—	—	—	—	11.0	5.0	—	3.0	6.0	—	0.5	—	3.5	0.5	17.5	—	—
5.1	5.17	1.54	—	10.6	—	—	1.2	—	9.1	7.8	0.8	2.1	5.3	0.2	5.5	2.5	7.5	2.4	4.7	—	—



## Appendix

## Annual Abstract of Meteorological Observations taken

HONG KONG, CHINA.

Lat. 22° 16' 20" N.

Month.	Mean Pressure.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean, 9 a.m.	Means of.		Abs. Min.		Abs. Max.		Per Cent.		Minimum.		
			Min.	Max.	Temp.	Day.	Temp.	Day.			Mean.	Per Cent.	Day.
January -	30.197	63.0	53.1	63.6	42.0	19th	73.0	24th	391	78.5	59.0	11th	
February -	30.137	60.0	48.7	59.0	42.0	25th	71.0	6th	356	82.6	69.0	2nd	
March -	30.080	63.0	53.5	67.2	45.0	13th	79.0	21st	453	83.9	58.0	16th	
April -	29.935	71.0	64.9	76.7	59.0	1st	53.0	5th	666	83.5	66.0	25th	
May -	29.851	77.9	75.3	82.9	63.0	1st	90.0	27th	799	80.2	65.0	27th	
June -	29.758	81.0	77.6	87.3	72.0	12th	92.0	26th	892	77.6	65.0	1st	
July -	29.708	82.2	77.4	86.8	74.0	31st	92.0	19th	894	77.6	55.0	25th	
August -	29.581	81.1	77.0	85.8	73.0	24th	93.0	24th	894	79.6	64.0	16th	
September -	29.824	79.9	75.7	86.1	71.0	17th	92.0	26th	790	74.4	45.0	14th	
October -	30.005	76.7	71.1	81.2	62.0	26th	88.0	5th	660	69.0	52.0	27th	
November -	30.148	69.6	63.6	75.7	56.0	12th	83.0	3rd	463	63.0	43.0	23th	
December -	30.177	67.8	61.5	74.0	50.0	28th	81.0	18th	454	69.8	52.0	14th	
Mean -	29.950	73.7	66.5	77.2	59.1	—	84.7	—	642	76.6	57.7	—	

SANITARIUM, HONG KONG, CHINA.\*

Lat. 22° 16' 20" N.

January -	-	-	-	-	-	-	-	-	-	-	-	-
February -	-	-	-	-	-	-	-	-	-	-	-	-
March -	-	-	-	-	-	-	-	-	-	-	-	-
April -	-	-	-	-	-	-	-	-	-	-	-	-
May -	-	-	70.6	78.7	61.0	4th	85.0	27th	-	-	-	-
June -	-	-	74.3	82.6	69.0	2nd	88.0	30th	-	-	-	-
July -	-	-	74.8	82.1	71.0	29th	88.0	20th	-	-	-	-
August -	-	-	73.8	82.4	67.0	24th	87.0	7th	-	-	-	-
September -	-	-	72.8	82.1	68.0	17th	86.0	4th	-	-	-	-
October -	-	-	67.2	77.9	59.0	24th	86.0	6th	-	-	-	-
November -	-	-	-	-	-	-	-	-	-	-	-	-
December -	-	-	-	-	-	-	-	-	-	-	-	-
Mean -	-	-	72.2	80.9	65.8	-	86.6	-	-	-	-	-

\* Six months only.

No. XXI.—continued.

at Netley and Foreign Stations in the Year 1885.

Long. 114° 9' 16" E. Height of Barometer Cistern above Sea, 18 feet.

Mean Amount of Cloud.	Rainfall.			Weather.									Wind.									
	Total.	Max.	Day.	Number of Days of									Number of Observations under each Point.									
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.		
6.6	0.82	0.70	27th	4	—	—	—	—	7.0	12.5	—	1.0	18.0	6.0	—	—	—	2.5	0.5	3.0		
9.3	2.48	1.00	24th	9	—	—	—	—	1.0	20.5	—	2.0	13.0	6.0	—	—	—	2.5	1.5	3.0		
6.5	2.48	0.98	27th	8	—	—	—	—	8.5	15.0	—	1.5	18.0	6.0	—	—	—	1.5	0.5	3.5		
6.9	16.36	6.97	30th	10	—	—	1	—	6.0	11.5	—	0.5	17.0	3.5	4.5	—	—	1.5	1.5	1.5		
7.3	5.30	1.90	3rd	18	—	—	—	—	3.5	14.5	—	1.0	9.5	4.0	—	0.5	9.0	4.0	1.5	1.5		
7.2	33.49	13.73	12th	18	—	—	1	—	3.5	10.5	—	—	5.0	8.5	—	1.0	8.5	4.5	1.0	1.5		
6.6	15.92	3.10	28th	10	—	—	—	—	7.0	14.0	—	2.0	1.0	9.0	—	1.0	6.0	7.0	4.0	1.0		
8.0	30.94	9.30	25th	17	—	—	1	—	—	13.5	1	1.0	1.0	7.0	8.0	—	3.0	6.0	4.0	1.0		
6.3	5.26	1.80	6th	12	—	—	—	—	10.0	7.0	—	4.0	3.0	11.0	2.0	1.0	—	3.0	4.0	2.0		
5.7	2.10	1.25	8th	6	—	—	—	—	16.0	8.0	—	1.0	3.5	19.5	4.0	1.0	—	1.0	—	1.0		
5.5	0.81	0.58	3rd	3	—	—	—	—	10.0	7.0	13	3.0	14.0	7.0	3.0	0.5	—	0.5	1.0	1.0		
4.9	1.28	1.28	25th	1	—	—	—	—	10.0	6.0	—	2.0	19.0	7.0	—	—	—	1.0	1.0	1.0		
6.7	9.77	3.55	—	9.6	—	—	0.2	—	6.8	11.6	1.1	1.5	10.1	7.8	1.3	0.4	2.2	2.9	1.7	1.7		

Long. 114° 9' 16" E. Height of Barometer Cistern above Sea, not given.

8.4	3.28	1.72	3rd	18	—	—	—	9.0	—	15.0	—	1.0	5.0	1.0	6.0	9.5	6.0	0.5	—	2.0
7.7	28.02	9.26	12th	16	—	—	1.5	—	1.0	14.0	—	—	1.0	—	10.0	10.0	4.0	0.5	1.5	3.0
7.7	13.71	2.83	28th	16	—	—	0.5	0.5	1.0	14.0	—	—	1.0	2.5	1.5	7.0	14.5	—	—	4.5
7.3	26.71	6.20	26th	19	—	—	0.5	—	4.0	8.5	—	—	6.0	—	6.5	—	11.5	—	1.5	5.5
5.7	4.67	1.23	7th	13	—	—	—	—	9.0	4.5	—	1.0	10.5	1.0	0.5	4.0	5.5	2.5	0.5	4.5
4.1	1.38	0.85	9th	8	—	—	—	—	14.0	0.5	—	1.5	23.5	—	0.2	—	1.5	—	—	2.5
6.8	12.96	3.68	—	0.1	—	—	0.4	0.1	4.8	9.4	—	0.5	4.5	0.7	4.1	5.1	7.1	0.5	0.5	3.6

## Appendix

## Annual Abstract of Meteorological Observations taken

KOROSKO, EGYPT.\*

Lat. not stated.

Month.	Mean Pressure.	Air Temperature.								Tension of Vapour.	Relative Humidity.		
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.		Per Cent.		Min.		
			Min.	Max.	Temp.	Day.	Temp.	Day.			Per Cent.	Day.	
January -	}												
February													
March													
April													
May													
June													
July													
August													
September													
October													
November		—	—	64.5	89.3	57.2	30th	96.8	7th	*408	45.4	30.2	24th
December		—	—	55.0	77.9	47.6	25th	86.4	5th	*327	53.7	42.4	9th
Mean		—	—	59.7	83.6	52.4	—	91.6	—	*367	49.5	36.3	—

\* 2 months only.

WADY HALFA, EGYPT.\*

Lat. not stated.

January -	.												
February -	.												
March -	.												
April -	.												
May -	.												
June -	.												
July -	.												
August -	.												
September -	.												
October -	.												
November -	.	—	—	65.4	84.7	58.4	30th	95.6	8th	*375	46.5	35.9	11th
December -	.	—	—	55.8	75.2	48.9	26th	85.9	18th	*290	50.4	40.9	19th
Mean -	.	—	—	60.6	79.9	53.6	—	90.7	—	*332	48.4	38.4	—

\* 2 months only.

ASSOUAN, EGYPT.

Lat. 24° 8' N.

January -	.												
February -	.												
March -	.												
April -	.												
May -	.												
June -	.												
July -	.												
August -	.												
September -	.												
October -	.												
November -	.												
December*	.	—	—	54.6	75.7	45.0	25th	85.5	15th	*283	54.9	43.6	21st
Mean -	.	—	—	—	—	—	—	—	—	—	—	—	—

\* 18 days only.

No. XXI.—*continued*.

at Netley and Foreign Stations in the Year 1885.

Long. not stated. Height of Barometer Cistern above Sea, feet.

Mean Amount of Cloud.	Rainfall.			Weather.									Wind.									
	Total.	Max.	Day.	Number of Days of.									Number of Observations under each Point.									
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.		
—	—	—	—	—	—	—	—	—	30°0	—	—	—	—	—	—	—	—	—	—	30°0	—	
—	—	—	—	—	—	—	—	—	31°0	—	—	—	—	—	—	—	—	—	—	31°0	—	
—	—	—	—	—	—	—	—	—	30°5	—	—	—	—	—	—	—	—	—	—	30°5	—	

Long. not stated. Height of Barometer Cistern above Sea, feet.

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Long. 33° 3' E. Height of Barometer Cistern above Sea, feet.

—	—	—	—	—	—	—	—	—	13.0	2.0	8	15.0	—	—	—	—	—	—	1.0	2.0	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Summary of Results of Meteorological Observations taken

Stations, with their Height above the sea.	Air Pressure.	Air Temperature.						Tension of Vapour.	Relative Humidity.			Mean amount of Cloud.	
		Mean, 9 a.m.	Means of		Abs. Min.		Abs. Max.		Per Cent.	Min.			
			Min.	Max.	Temp.	Date.	Temp.			Date.	Per Cent.		Date.
Mediterranean: ft.													
Gibraltar - - - 53	30·064	63·6	55·9	69·0	36·0	16 Jan.	87·4	19 Aug.	·515	88·7	58·8	Feb.	4·1
Scutari - - - 60	29·955	64·7	50·4	68·7	28·0	27 Dec.	100·4	22 July	·376	70·0	39·6	14 June	5·2
Cyprus:													
Nicosia <sup>a</sup> - - - 592	—	—	49·8	80·5	35·0	5 Dec.	94·2 <sup>c</sup>	26 Oct.	·478	68·0	27·0 <sup>c</sup>	16 Oct.	3·6
Polymedia <sup>b</sup> - - - 460	29·997	64·3	53·4	75·6	36·5	3 Jan.	101·2 <sup>f</sup>	18 May	·444	66·8	28·3 <sup>g</sup>	8 May	4·2
Mt. Troados <sup>e</sup> - - - 5,720	29·898	65·1	53·7	75·1	42·7	10 June	88·4	6 Aug.	·375	59·8	26·8	21 Aug.	2·6
Malta - - - 70	29·985	68·6	59·7	69·3	40·0	1 Mar.	91·4	8 Aug.	·522	75·1	34·0	8 Aug.	3·1
Natal, "Fort Napier" - - - 2,294	29·965	65·6	54·1	82·4	35·8	14 June	106·6	7 Nov.	·427	62·7	30·0	17 Nov.	4·4
Sierra Leone - - - 224	29·904	82·2	82·2	93·9	70·0	8 May	96·0	30 Jan.	·948	87·5	58·0	12 Aug.	2·6
American & West Indies:													
Barbados - - - 30	30·023	81·7	76·5 <sup>a</sup>	86·7 <sup>a</sup>	70·0 <sup>a</sup>	15 Jan.	92·0	23 Oct.	·752	66·6	42·4	19 Mar.	4·0
Newcastle, Jamaica - - - 3,900	30·217	65·1	Instruments not yet replaced. Instruments removed in December owing to heavy gale.					—	—	—	—	4·5	
Upper Park Camp - - - 245	30·070	82·3	68·2	out of order.	58·0	4 Aug.	Out of order.	·740	60·9	40·4	30 Aug.	2·6	
Nassau, Bahamas - - - 44	30·066	78·3	70·4 <sup>i</sup>	85·3	56·0	27 Dec.	101·0	29 June	·724	71·6	49·1	17 Oct.	5·9
Bermuda - - - 151	29·975	72·1	—	77·5	—	—	94·0	12 Aug.	·696	82·1	54·0	22 June	5·2
Singapore - - - 110	29·048	80·8	68·7	92·9	60·0	6 June	99·8	15 Dec.	·938	80·2	60·2	11 Feb. and 1 Aug.	5·1
Hong Kong - - - 18	29·950	72·7	66·5	77·2	42·0	19 Jan.	93·0	24 Aug.	·642	76·6	43·0	5 Nov.	6·7
Sanitarium <sup>b</sup> - - - -	—	—	72·2	80·9	59·0	24 Oct.	88·0	30 June	—	—	—	—	6·8
Egypt:													
Assouan <sup>c</sup> - - - -	—	—	54·6	75·7	45·0	25 Dec.	85·5	15 Dec.	·283	54·9	43·6	21 Dec.	—
Wady Halfa <sup>d</sup> - - - -	—	—	60·6	79·9	48·9	26 Dec.	95·6	8 Nov.	·532	46·4	35·9	11 Nov.	—
Korosko <sup>d</sup> - - - -	—	—	59·7	83·6	47·6	25 Dec.	96·8	7 Nov.	·367	49·5	30·2	24 Nov.	—

<sup>a</sup> 3 months.    <sup>b</sup> 6 months.    <sup>c</sup> 18 days.    <sup>d</sup> 2 months.    <sup>e</sup> 4 months.    <sup>f</sup> 27 days.    <sup>g</sup> 24 days.

## at Foreign Stations in the Year 1885.

Rainfall.			Weather.								Wind.										Latitude.	Longitude.
Total.	Max.	Date.	Number of Days of								No. of Observations under each Point.								Calm.			
			Rain.	Snow.	Hail.	Thunder-storm.	Fog.	Clear sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.				
44° 84	0° 90	11 Dec.	8° 2	—	—	—	—	10° 3	3° 0	—	—	8° 9	3° 1	0° 3	0° 08	2° 9	6° 6	8° 4	0° 1	36° 6 N.	5° 20 W.	
19° 38	1° 16	4 Apr	10° 0	0° 7	0° 6	1° 2	0° 6	11° 3	11° 2	—	5° 6	9° 3	3° 5	8° 0	3° 6	4° 9	8° 0	0° 1	1° 6	41° 0 N.	29° 3 E.	
0° 58	0° 50	30 Dec.	0° 3	—	0° 6	—	—	6° 3	4° 3	—	2° 3	5° 6	3° 6	1° 3	2° 0	3° 6	4° 6	2° 3	—	35° 10 N.	33° 21 E.	
22° 91	2° 11	9 Feb.	7° 2	0° 1	1° 2	1° 5	0° 1	11° 8	7° 1	0° 3	2° 8	2° 8	4° 2	2° 7	2° 1	3° 2	5° 2	4° 7	—	34° 40 N.	32° 2 E.	
7° 27	1° 59	3 July	5° 2	—	—	2° 0	—	21° 5	3° 5	—	7° 6	11° 5	0° 8	—	0° 2	0° 5	4° 0	5° 0	—	34° 57 N.	32° 55 E.	
12° 10	1° 93	25 Jan.	3° 9	—	0° 8	0° 1	—	16° 5	3° 4	0° 6	0° 8	4° 1	2° 0	3° 8	1° 1	4° 6	2° 8	11° 1	—	35° 53 N.	14° 30 E.	
36° 81	1° 75	23 Feb.	8° 1	—	—	3° 2	—	13° 8	10° 4	0° 16	2° 9	5° 9	6° 3	4° 8	0° 3	1° 1	1° 1	1° 3	0° 5	29° 3 S.	30° 2 E.	
168° 93	8° 00	11 Sept.	11° 9	—	—	5° 3	—	14° 7	—	—	7° 1	0° 3	4° 7	1° 1	8° 3	1° 5	3° 5	0° 7	2° 8	8° 29 N.	13° 9 W.	
34° 25	1° 02	23 Feb.	11° 9	—	—	0° 7	—	14° 3	5° 8	—	0° 3	26° 2	3° 3	—	—	0° 3	—	0° 1	—	13° 7 N.	59° 46 W.	
106° 46	11° 03	22 Dec.	11° 5	—	—	5° 5	—	15° 5	7° 2	0° 8	4° 1	7° 7	1° 4	1° 6	1° 7	4° 1	1° 5	4° 0	3° 0	18° 6 N.	76° 42 W.	
56° 27	5° 63	23 Dec.	5° 5	—	—	1° 6	—	23° 8	2° 6	—	0° 1	1° 3	0° 1	19° 7	1° 6	3° 7	0° 8	1° 1	1° 6	17° 59 N.	76° 56 W.	
40° 61	3° 90	27 Sept.	10° 5	—	0° 8	1° 3	—	2° 8	9° 8	1° 6	1° 2	7° 2	5° 1	7° 6	2° 5	2° 8	0° 9	2° 8	—	25° 5 N.	77° 21 W.	
47° 13	6° 00	9 Nov.	0° 9	—	—	1° 2	—	13° 7	3° 8	—	3° 4	3° 0	0° 7	6° 0	5° 4	8° 0	1° 6	1° 9	—	32° 17 N.	61° 47 W.	
62° 14	4° 57	19 Dec.	10° 6	—	—	1° 2	—	9° 1	7° 8	0° 8	2° 1	5° 3	0° 2	5° 5	2° 5	7° 5	2° 4	4° 7	—	1° 16 N.	105° 31 E.	
117° 24	13° 73	12 June	9° 6	—	—	0° 2	—	6° 8	11° 6	1° 1	1° 3	10° 1	7° 8	1° 8	0° 4	9° 2	2° 9	1° 7	1° 7	22° 16 N.	114° 9 E.	
77° 77	0° 26	12 June	0° 1	—	—	0° 4	0° 1	4° 8	9° 4	—	0° 5	4° 5	0° 7	4° 1	5° 1	7° 1	0° 5	0° 5	3° 6	22° 16 N.	114° 9 E.	
—	—	—	—	—	—	—	—	13° 0	4° 0	0° 3	15° 0	—	—	—	—	—	1° 0	2° 0	—	24° 8 N.	33° 3 E.	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	} Not shown.		
—	—	—	—	—	—	—	—	30° 5	—	—	—	—	—	—	—	—	—	30° 5	—			

° 8 months.

° Observations taken for 2 months; instrument out of order.

## APPENDIX No. XXII.

---

THE PARKES' MEMORIAL PRIZE.

---

---

Surgeon-General Sir T. LONGMORE, Kt., C.B., *President of Committee.*

Professor F. S. B. F. DE CHAUMONT, M.D., F.R.S., *Treasurer.*

Surgeon A. M. DAVIES, *Secretary.*

---

The following is the subject for the next prize :—

ON THE ETIOLOGY AND PREVENTION OF YELLOW FEVER, TO BE ILLUSTRATED, SO FAR AS PRACTICABLE, FROM THE PERSONAL EXPERIENCE OF THE WRITER.

*The Prize is One Hundred Pounds in Money and a Gold Medal value Fifteen Guineas.*

The Competition is open to all Medical Officers of the Army, Navy, and Indian Services of Executive Rank on full pay, with the exception of the Assistant Professors of the Army Medical School during their term of Office. Essays to be sent to the Secretary of the "Parkes' Memorial Fund," Royal Victoria Hospital, Netley, on or before the 31st day of December 1888. Each Essay to have a Motto, and to be accompanied with a sealed envelope bearing the same Motto and containing the name of the Competitor.

---

## APPENDIX No. XXIII.

## THE ALEXANDER MEMORIAL FUND.

## COMMITTEE.

Director-General Sir T. CRAWFORD, K.C.B., M.D., Hon. Surgeon to the Queen, *President*.  
 Surgeon-General W. A. MACKINNON, C.B.  
 Surgeon-General T. G. BALFOUR, M.D., F.R.S., Hon. Physician to the Queen.  
 Surgeon-General Sir T. LONGMORE, C.B., Hon. Surgeon to the Queen, Professor of Military Surgery.  
 Deputy Surgeon-General J. A. BOSTOCK, C.B., Hon. Surgeon to the Queen.  
 Brigade-Surgeon ALFRED F. S. CLARKE, M.D.  
 Surgeon-Major F. S. B. F. DE CHAUMONT, M.D., F.R.S., Professor of Military Hygiene.  
 Inspector-General of Hospitals, R. LAWSON.  
 Surgeon-General WM. MUNRO, C.B., M.D.  
 Surgeon-General J. IRVINE, M.D., Hon. Physician to the Queen.  
 Brigade-Surgeon FRANCIS COLLINS, M.D.

Surgeon-Major W. JOHNSTON, M.D., *Honorary Secretary*.

## PRIZE ESSAY GOLD MEDALLISTS.

- 1870. Assistant Surgeon A. B. R. MYERS, Coldstream Guards.
- 1873. Surgeon F. H. WELCH, Army Medical Department.
- 1876. Surgeon-Major J. H. PORTER, Army Medical Department.
- 1879. Surgeon JOHN MARTIN, Army Medical Department.
- 1882. Surgeon-Major F. H. WELCH, Army Medical Department.
- 1885. Surgeon JOHN MARTIN, Medical Staff.

At a meeting of the Committee, held on the 4th March 1885, it was unanimously resolved that the prize of 50*l*. and Gold Medal of the value of 10*l*. be awarded to Surgeon John Martin, Medical Staff, for the best essay on "Anti-septic Surgery and its application in Military Hospitals and in the Field."

The Committee hereby intimate that the subject for the next competition is "On the Relations between the Food and Work of the British Soldier, and their proper adjustment in Peace and War; on the occurrence of Scurvy among Troops, and its prevention; and on the use of Preserved and Concentrated Foods. With suggestions for alterations or improvements in the existing rations and times of meals."

Essays to be despatched so as to reach the President of the Committee on or before the 31st December 1887.

Essays are to be legibly and clearly written, superscribed with a brief motto, and accompanied by a sealed envelope, similarly superscribed, containing the name and address of the author.

No essay shall exceed in length 50 pages of ordinary printed octavo, which may be estimated as amounting to 20,000 words (a page of octavo containing about 400 words). This limit to be exclusive of tables, which may be added in the form of appendices.



**LONDON: Printed by EYRE and SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty.  
For Her Majesty's Stationery Office.**









320

1+



3 2044 103 001 525

